ALASKA AGRICULTURAL EXPERIMENT STATIONS
JUNEAU, ALASKA
Under the supervision of the
UNITED STATES DEPARTMENT OF AGRICULTURE

REPORT OF THE ALASKA AGRICULTURAL EXPERIMENT STATIONS

1930

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Issued November, 1931

UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF EXPERIMENT STATIONS

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ALASKA AGRICULTURAL EXPERIMENT STATIONS, JUNEAU, SITKA, KODIAK, FAIRBANKS, AND MATANUSKA

[Under the supervision of the Office of Experiment Stations, United States Department of Agriculture]

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CONTENTS

REPORT OF THE DIRECTOR

H. W. Alberts

During the year covered by this report work was in progress at the Sitka, Kodiak, Fairbanks, and Matanuska stations. The Sitka and Kodiak stations are on the south coast of Alaska. The Sitka station is in a timbered region, and the Kodiak station is in a treeless region. The Fairbanks and Matanuska stations are located in regions where field crops can be grown on extensive areas of land. The range of temperature is wider in the Fairbanks region during the growing season than in the Matanuska region. This difference is reflected in the results obtained with farm crops. Cereal grains generally mature earlier at Fairbanks than at Matanuska, but they make less vegetative growth. The average yields of wheat and barley differ slightly in the two regions, whereas the yield of oats is considerably higher in the Matanuska region. Table 1 gives a comparison in yields of the major farm crops of the two regions for the period 1926–1930, inclusive.

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TABLE 1.—*Comparison in yields of the four major farm crops grown at the Fairbanks and Matanuska stations during the period 1926–1930*

Crop and station	1926	1927	1928	1929	1930	Average
Oats:	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*
Fairbanks	77	35	33	64	28	47.4
Matanuska	82	76	41	45	38	56.4
Barley:						
Fairbanks	24	25	24	21	12	21.2
Matanuska	29	30	20	18	15	22.4
Wheat:						
Fairbanks	17	15	31	21	11	19.0
Matanuska	14	28	17	17	22	19.6
Potatoes:						
Fairbanks	228	137	85	200	208	171.6
Matanuska	201	169	138	162	167	167.4

Instruments for measuring evaporation were received from the United States Weather Bureau and properly installed at both the Fairbanks and the Matanuska stations in 1929.

On August 28, 1930, a committee of three members of the United States Senate visited the Matanuska station and the farming region of the Matanuska Valley.

A number of experiments carried on cooperatively with other departments of the Government were in progress during the year, and special problems affecting agriculture in certain regions were studied.

The cooperative experiment in creamery work at the Curry creamery progressed satisfactorily, and farmers who formerly depended almost entirely upon the potato crop for their income are now becoming interested in dairy farming. The creamery record for the years ended December 31, 1929 and 1930, is shown in Table 2.

TABLE 2.—*Cream and butterfat record of the creamery operated by the Alaska Railroad for the years ended December 31, 1929 and 1930*

Month	1929		1930	
	Cream received	Butterfat received	Cream received	Butterfat received
	Pounds	*Pounds*	*Pounds*	*Pounds*
January	528.0	160.0	195.0	76.5
February	725.5	218.0	460.0	174.5
March	893.0	241.0	571.0	229.0
April	859.0	247.0	112.0	41.0
May	752.0	215.0	396.0	136.0
June	856.5	252.0	625.0	216.5
July	526.0	173.5	618.5	202.5
August	337.0	112.5	588.5	186.0
September	242.5	85.0	431.5	124.0
October	124.5	47.0	340.5	94.5
November	111.0	43.5	535.0	167.6
December	107.0	42.0	791.0	284.5
Total	6,062.0	1,836.5	5,664.0	1,932.6

Experimental work in dairying was begun at Eklutna in the spring of 1930 by the Matanuska station, working in cooperation with the Native Industrial School of the United States Office of Education. The animal husbandman of the Matanuska station supervises the experimental work of the dairy, and the experiment station furnishes the cattle. The school maintains the cattle, furnishes feeding and

milk-production records to the station, and is given in exchange all the milk produced for the children. The station on its part is benefiting by enlarging the scope of its work in breeding dairy cattle. The herd at Eklutna numbers one bull and three cows of the Galloway-Holstein crossbreds.

The colonization project begun last year by the Alaska Railroad with the stations cooperating was successfully continued.

The stations participated in the annual agricultural fairs and made representative exhibits at each of the fairs at Fairbanks, Anchorage, and Juneau.

Apiculture is being undertaken at the Matanuska station and by private owners in the southern part of the Territory.

In July, 1929, W. T. White made an agricultural survey of the Shearwater Portage and Kiluda Bay regions. The report is given in full on page 37.

SITKA STATION

WEATHER CONDITIONS

The mean temperature for the growing season, which extends from May to September, inclusive, was 51.5° F., and the total precipitation for the same period was 28.08 inches. The rate of evaporation was low. There were 16 clear days, 63 partly cloudy days, and 74 cloudy days. Because of the superabundance of moisture, the comparatively low mean temperature, and the few sunny days, weeds were kept under control with difficulty. The last killing frost in the spring occurred May 20, and the first killing frost in the fall September 23. The frost-free period was 125 days.

DISTRIBUTION OF NURSERY STOCK

Distribution of nursery stock for trial to 106 residents in different parts of Alaska included 20 apple trees, 306 strawberry plants, 95 raspberry plants, 63 currant plants, 62 gooseberry plants, 22 pounds of seed potatoes, 25 rhubarb plants, 3 horseradish plants, 4 mint plants, 2 perennial onion plants, 50 willow cuttings, 12 willow trees, 333 ornamental shrubs, 98 perennial flowering plants, 24 tulip bulbs, and 24 narcissus bulbs.

THE ORCHARD

Apples.—Apple trees bore little fruit this year. Yellow Transparent, considered the best variety for southeastern Alaska, produced only a few apples. The fruit, while small, was of fair quality, and matured October 1. Anoka produced several apples for the first time. Whitney crab apple produced small fruits which failed to mature. Keswick (Keswick Codlin) was a heavy yielder, but the fruit was attacked severely by larvae of the codling moth before it had a chance to mature. A hybrid tree (native crab, *Malus rivularis* × Keswick) produced fruit for the first time. It resembles the native apple in appearance, but is about twice as large as the latter, and nearly as sour. Most of the apple trees blossomed, but only a few produced fruit. The trees were sprayed with Bordeaux mixture June 16 and again July 14 as a precautionary measure against scab. Twigs from terminal buds made a growth of approximately 6 to 18 inches during the season. Two apple trees which were trained against a building wall made a growth of 20 to 40 inches from their terminal buds.

Cherries.—Two small trees of Republican yielded 4 quarts of cherries, which were ripe August 15. Republican appears to be the most desirable variety for the region. Next in order of merit was Early Richmond, which bore ripe fruit August 28. Late Duke and Black Tartarian also set fruit that ripened. Heavy rains caused the fruit of some of the varieties to crack before ripening. In an effort to prevent cracking a tree of Black Tartarian was covered with canvas August 14. Covering with canvas was found to lessen the tendency of the fruit to crack and to prevent it from ripening as well. Wragg and Montmorency produced fruit of inferior quality which cracked before ripening. The fruit of Montmorency failed to ripen under canvas. It did not crack, however.

Plums.—Some of the plum trees set fruit, none of which ripened.

FIGURE 1.—The Island Belle variety of grape, Sitka station

Pears.—A hybrid pear tree (S. P. I. No. 43183 × *Pyrus communis*) produced several small fruits, none of which matured.

Peaches.—The Triumph and Alexander varieties of peaches produced a small number of fruits. The trees are growing against the wall of the propagating house.

GRAPES

Up to this time grape growing has not been successful in Alaska. The Island Belle variety, which has been tried for several years, produces shoots 2 to 6 feet long each spring, but the vines winterkill even when they are protected. (Fig. 1.)

SMALL FRUITS

Strawberries.—Investigational work on 280 strains of strawberries was continued. Hybrid No. 320 is one of the earliest that is grown at the station. The first fruit was ripe July 7. Hybrid No. 468 (Harding) ripened July 12. This is one of the best hybrids under trial because it is firm and of excellent flavor. Hybrid No. 7537 is one of the most prolific of the lot of hybrids at the station. The fruit, which began to ripen July 24, has a good flavor, but is pale in color and not firm. Deer again damaged the tender plants during the nights in the early spring. As many as nine deer were seen in the strawberry patch on one occasion. Robins did some damage to the ripe fruit.

The native strawberry (*Fragaria chiloensis*, reported by Georgeson (*8 p. 6*)[1] in 1923), which was used as one of the parents in the production of the station hybrids, is found growing on the sandy beaches of the south Alaskan coast. La Pérouse (*12, v. 1, p. 172*) reported finding it in 1786, and Lisiansky (*13, p. 236*) in 1805. Jackson (*11, p. 24*) in 1880 reported that the plant was growing wild near Mount Edgecumbe. Funston (*6, p. 331*) in 1892 found a heavy growth of the plants in the region of Yakutat Bay, where the fruit began to ripen about July 1. Strawberries were abundant at Dalton Creek as late as August 15. Evans, Killin, and Jackson (*5, p. 15*) in 1898 reported finding the plant growing in Alaska. Georgeson (*7, p. 289*) found that the native varieties blossomed earlier than did the cultivated varieties. Moser (*15, p. 374*) states that large areas of strawberries are found growing over the flats of Barlet Cove on the east shore of Glacier Bay. The fruit is sought by the Indians during July and August. It is also found growing at Lituya Bay and at Sea Lion Cove on Kruzof Island, in southeastern Alaska. Large areas of the plants are found on Hinchinbrook Island, about 18 miles from Cordova, and small areas have been observed on the sandy borders of lagoons near Seldovia. The native strawberry grows also at several places on the Alaskan Peninsula. The fruit in this region is reported to be larger than that of southeastern Alaska. It fails to develop when the weather is dry in the early summer, but the plants bear abundantly during humid summers. The native strawberry has been reported as growing near the lagoons of the three promontories on the northwest shore of Pavlov Bay, on the north shores of Cold Bay, and on the north shore of Morzhovia Bay.

The natives dip the fresh strawberries in seal oil preparatory to eating them, and in former days they preserved the fruit in considerable quantities for winter use. The fruit was picked by the native women, and when nearly dry was pressed into cakes about an inch thick. It was then allowed to dry more thoroughly and stored for winter use. When wanted for the table, the dried berries were moistened sufficiently to soften them and then dipped in seal oil.

Georgeson (*8, p. 6*) developed hardy strains by crossing the wild strawberry with introduced cultivated varieties. The hybrid plants were distributed to settlers and are now found growing in the gardens of all the towns in southeastern and southern Alaska.

Raspberries.—Cuthbert made a heavy yield of berries. Ranere (St. Regis), Latham, and La France were almost total failures. Black-cap varieties have not been successfully grown at the station.

[1] Italic numbers in parentheses refer to Literature Cited, p. 48.

Blackberries.—All the old canes of the Logan (Loganberry) winterkilled, and the young shoots produced no fruit.

Currants.—Holland (Long-bunch Holland) was the most desirable of the red varieties, and ripened August 16. Prince of Wales, a black variety, ripened August 24. White Dutch and White Imperial were of equal merit, and ripened August 16.

Gooseberries.—Of the gooseberries, Champion is the leading variety for southeastern Alaska. It ripened August 12. Pearl and Poorman ripened August 14 and August 28, respectively.

Cranberries.—The cranberry plants obtained from Long Beach, Wash., in 1929 do not appear to be adapted to local conditions. Most of the plants winterkilled. Plants set out in a bed of wet moss thrived better than those set in a prepared bed of soil.

VEGETABLES

Asparagus.—Several cuttings of asparagus of the Giant Washington variety were made from May 16 to June 9. It was of excellent flavor and free from rust.

Beets.—Four varieties of beets were sown in the open May 5 and the resultant crop was harvested October 9. The quality of all four varieties was good.

Cabbage.—The varieties Early Summer and Copenhagen Market were sown in a coldframe April 22 and transplanted to the garden June 2. The varieties produced heads weighing about 4 pounds each. Early Jersey Wakefield, Early Winningstadt, Charleston, and Dwarf Flat Dutch were sown in a coldframe May 20, and the resultant plants were transplanted to the open June 28. This date was found to be too late for planting this year. Early Jersey Wakefield produced heads weighing about 3 pounds each, but the other varieties failed to produce. The plants were found to be infested with clubroot due to a slime mold (*Plasmodiophora brassicæ*). They were also attacked by root maggots. In an experiment made to determine the value of lime for clubroot control, air-slaked lime was applied to plants of the Copenhagen Market variety at the rates of 1, 2, 3, and 4 tons, respectively, per acre. The application of only 1 or 2 tons of lime per acre did not check the disease to any appreciable extent. The application of 4 tons per acre partly checked the disease. Results of the experiment indicate that more than 4 tons of lime are required to control clubroot effectively.

Carrots.—Five varieties of carrots were sown in the open June 4. The crop was harvested October 9. The roots were comparatively small, but of excellent quality.

Cauliflower.—Cauliflower was almost a complete failure because of clubroot infestation.

Kale.—Kale was planted in the open June 28. It grew well until it was destroyed by deer.

Kohlrabi.—White Vienna was sown May 20, and the resultant plants were set in the open June 28. The crop was ready for the table August 8. Successive plantings of this crop should be made if a continuous supply is wanted for the table during the latter part of the summer and the fall.

Leek.—Carentan Giant was sown in the open June 2. The resultant plants remained small and were not harvested.

Lettuce.—Both head and leaf lettuce developed rapidly and was crisp.

Onions.—Onion seed was sown June 2, but the resultant plants made little growth. Onions are not well adapted to the region.

Parsley.—The varieties Moss Curled and Fern Leaved were sown in the open June 2. Both varieties grew rapidly and produced good crops.

Spinach.—King of Denmark and Victoria were planted June 3. Several cuttings were made from August 1 to August 22. After August 22 the plants went to seed.

Swiss chard.—Fordhook Giant was sown June 4. The young plants were harvested at intervals from August 9 to November 22. Swiss chard can be used for greens after the spinach crop forms seed stalks.

POTATOES

Five hills each of 27 commercial varieties and 72 seedling strains of potatoes were planted to determine their comparative value for

FIGURE 2.—Hedge of basket willows, Sitka station

southeastern Alaska. The tubers were taken from the root cellar May 19, green sprouted, and planted June 2 when the sprouts were 0.2 to 0.5 inch long. The varieties emerged in 13 to 22 days after they were planted, and all made vigorous vine growth. The crop was harvested October 8 and stored in the root cellar under a temperature of approximately 36° F. during the winter. The temperature in this cellar rises to about 44° in May, and remains almost constant throughout the summer.

FLORICULTURE

Seeds of annual flowering plants were sown May 29. Plants of the different varieties were in blossom from August 1 to October 15. Spireas (several varieties) gave the greatest satisfaction of the ornamentals. *Lonicera thibetica* and California privet winterkilled. *L. morrowii*, *Spiræa vanhouttei*, basket willow (fig. 2), and single-

flowered varieties of *Rosa rugosa* were found to make desirable hedge plants. A number of small plants of the yellow cedar (*Chamæcyparis nootkatensis*), set out to test their value as hedge plants, made little growth.

SOIL STUDIES

An experiment was made to determine the underground-water table at different representative places on the Sitka station reserve. Four holes, each 4 feet deep, were dug. Hole No. 1 was made in the orchard, which has fairly good drainage. Hole No. 2 was made in a field on the north side of a creek, also on well-drained ground. Hole No. 3 was in the same field as hole No. 2, but in a higher part of the field. Hole No. 4 was made on uncultivated muskeg ground. The first measurement was made May 1, and weekly measurements were made thereafter until October 30. The water table was lowest July 17, and highest October 30. The rise and the fall of the water table correlated with the distribution of rainfall for the season. Table 3 shows the distances of water tables from the surface of the ground.

TABLE 3.—*Distances of water tables from the surface of the ground at the Sitka station during the summer of 1930*

Date of measurement	Depth of water table in—				Date of measurement	Depth of water table in—			
	Hole No. 1	Hole No. 2	Hole No. 3	Hole No. 4		Hole No. 1	Hole No. 2	Hole No. 3	Hole No. 4
May:	*Inches*	*Inches*	*Inches*	*Inches*	August:	*Inches*	*Inches*	*Inches*	*Inches*
1	21	26	20	5	7	44	44	25	12
8	22½	27	19	5	14	20	27	8	4
15	23	28½	19	5	21	21	28	10	4½
22	24	30	18	5	28	24	31	11	4½
29	27½	34	14½	5	September:				
June:					4	29	34	12	4½
5	32	38½	10	5	11	35	38	13	4½
12	32	36	11	5½	18	18	26	5½	4
19	32	34	12	6	25	23	28	3	3
26	34	38	18	9	October:				
July:					2	10	19	½	½
3	38	42	28	13	9	16	23	3½	2
10	41	44	29½	15	16	24	30	8	4
17	44	46	31	16	23	14	28	½	1
24	43	39½	14	5	30	8	12		
31	43½	41	18½	8					

MATANUSKA STATION

WEATHER CONDITIONS

Weather conditions during the year deviated from normal in two respects: The precipitation during August and September, 1930, was 11.45 inches, or more than twice as much as the average for the same months during the 10 preceding years, and the temperature during December, 1929, and January and February, 1930, was lower than the average for the same period during the 10 preceding years. These extremes were reflected in crop growth and yields. Table 4 gives the average monthly precipitation for the period 1919–1928, and the monthly precipitation for the years 1929 and 1930.

TABLE 4.—*Record of the average monthly precipitation for the period 1919–1928 and of the monthly precipitation for 1929 and 1930 at the Matanuska station*

Month	10-year average	1929	1930	Month	10-year average	1929	1930
	Inches	*Inches*	*Inches*		*Inches*	*Inches*	*Inches*
January	0.798	1.07	0.87	August	2.597	2.09	6.21
February	.649	1.88	.46	September	2.639	2.69	5.24
March	.604	.98	1.42	October	1.846	2.42	1.49
April	.441	.53	.57	November	.622	1.05	2.18
May	.405	.77	1.12	December	1.333	.31	1.12
June	1.065	.52	2.72				
July	1.757	2.51	2.04	Total	14.756	16.82	25.44

During 1930 the precipitation at the station was the heaviest since its establishment. The heaviest precipitation previous to that of 1930 was in 1925, when 20.04 inches of rain fell, or 5.4 inches less than during 1930. The two months of greatest precipitation were August and September, the rainfall in August being 6.21 inches and that in September 5.24 inches. The precipitation in September, 1925, 7.55 inches, was the greatest that has ever been recorded in the Matanuska region during any one month. August, 1930, had the next heaviest precipitation. Reference to the weather report of the Matanuska station for August, 1930, showed that rain fell in measurable quantities on 28 of the 31 days. This continuous rainfall made it impossible to cultivate crops with any degree of success. Table 4 shows that the precipitation in each month of 1930 was above the average for the 10 preceding years except in February, October, and December when it was 0.189, 0.356, and 0.213 inch, respectively, below the average for the same period. This circumstance had little effect on crop yields because the presence of sufficient moisture in May and June and the absence of moisture in August and September are the two factors of greatest importance in producing and curing crops in this region.

The mean monthly temperature for December, 1929, and for January and February, 1930, was lower than the average for the preceding 10 years. Snowfall for this same period was exceedingly light, 12.75 inches being the total for January and February. The low temperatures in these three months in addition to the light snowfall were probably the cause of the winterkilling of a large percentage of the fruit trees and shrubs in the experimental orchard. Table 5 gives the average mean monthly temperatures for the period 1919–1928, and the mean monthly temperatures for the years 1929 and 1930 at the Matanuska station.

TABLE 5.—*Record of the average mean monthly temperatures for the period 1919–1928 and of the mean monthly temperatures for 1929 and 1930 at the Matanuska station*

Month	10-year average	1929	1930	Month	10-year average	1929	1930
	°F.	°F.	°F.		°F.	°F.	°F.
January	11.50	19.30	9.58	July	55.85	55.93	58.10
February	19.33	24.98	5.98	August	55.37	52.67	57.00
March	24.68	21.10	21.67	September	46.97	52.26	44.80
April	35.11	32.78	34.81	October	36.79	37.42	32.40
May	46.94	48.60	42.00	November	22.30	29.11	19.19
June	54.52	55.54	53.25	December	13.67	7.32	28.05

It will be noted that the mean monthly temperatures for 1930 were lower than the average for the 10 preceding years with the exception of those in July and August, which were slightly higher, and in December, which was more than twice as high as the 10-year average. The monthly mean for the average of the 10 preceding years gradually increased from January to July, whereas from July to January it decreased. The mean temperature values for 1930 do not coincide with those of the average for the 10 preceding years, February having a lower mean temperature than January, a condition that would probably be reversed over a number of years. January had 17 days during which the minimum temperature ranged from −1 to −22° F. and February had 19 days during which the minimum temperature ranged from −1 to −25°, facts which account for the mean low temperatures during these months in 1930. The summer of 1930 was similar to that of 1929 in the occurrence of a large number of cloudy

FIGURE 3.—Seeding grain, Matanuska station

days. Cloudy days and unusually high precipitation were factors creating unfavorable conditions for ripening and harvesting grain and hay.

GRAIN CROPS

Most of the land used for field crops was plowed in the fall of 1929. Favorable weather in the spring made it possible to plant the crops a week earlier than was done last year. All cereal grains were planted May 21 and May 22. An 8-foot drill drawn by a tractor was used for seeding. One man operated the tractor and another the drill. (Fig. 3.) Following seeding, the land was "cultipacked." Nearly one-fourth inch of rain fell May 25, three days after seeding was done. The next rain began June 6 and continued intermittently until June 22. The total precipitation for this period was 2.72 inches. These rains caused the plants to make vigorous growth and also encouraged weed growth. Lamb's-quarters (*Chenopodium album*) formed a dense mat of foliage near the ground and was a serious

problem in the grain plats. The grain crops were harvested September 15, 16, and 17. After being allowed to cure in the field for two weeks, they were stored in the barn, and threshed October 23.

Barley.—Barley No. 19b was the first general field crop to be planted. The seed had previously been tested for germination and treated with copper carbonate for smut control. This variety of barley, seeded at the rate of 80 pounds per acre, emerged June 1, headed July 15, matured September 15, and yielded at the rate of 15 bushels per acre.

Wheat.—Siberian No. 1, seeded at the rate of 80 pounds per acre on a 1-acre plat May 21, emerged June 1, headed July 12, matured September 15, and yielded 22 bushels. Prior to being sown the seed was treated with copper carbonate for smut control.

Oats.—Leader, seeded at the rate of 100 pounds per acre on a 1-acre plat May 22, emerged June 6, headed July 14, matured September 16, and yielded 43 bushels. Climax, seeded at the rate of 90 pounds per acre on a 1-acre plat May 22, emerged June 2, headed July 14, matured September 16, and yielded 41 bushels. Abundance, seeded at the rate of 90 pounds per acre on 4.75 acres of land May 23, emerged June 6, headed July 18, matured September 16, and yielded at the rate of 31 bushels per acre.

Variety tests.—Eight varieties of spring wheat, 7 of barley, and 10 of oats were grown for comparison of earliness, yield, stiffness of straw, and quality. Each variety was seeded May 26 in four systematically distributed plats of 3 rod rows each. Seed of the hulled oat and barley varieties was treated for smut control as recommended by Sayre (*17*). No smut developed in any of the varieties. Table 6 gives the results of the variety test.

TABLE 6.—*Results of varietal tests of grain at the Matanuska station, 1930*

Variety	Date headed	Date matured	Length of time from seeding to maturity	Height of plants	Yield of grain per acre
			Days	*Inches*	*Bushels*
Wheat:					
Siberian No. 1	July 15	Sept. 15	112	36	32
H. G	July 18	Sept. 16	113	36	34
Ruby	do	[1]		40	
Garnet	do	[1]		40	
Hybrid No. 30	July 20	[1]		40	
Hybrid No. 63	do	[1]		40	
Marchosser	July 19	[2]		45	
Romanow	July 23	[2]		54	
Barley:					
Trapmar	July 19	Sept. 9	106	45	32
Hybrid No. 68D	do	Sept. 6	103	39	26
Hybrid No. 14Bd	July 22	Sept. 9	106	42	34
Hybrid No. 68E	July 20	Sept. 6	103	45	40
Hybrid No. 28	July 23	[1]		48	
Hansen	July 15	Sept. 5	102	40	53
Manchuria	July 20	Sept. 9	106	45	43
Oats:					
Canadian	July 22	do	106	42	70
Hybrid No. 102	July 25	Sept. 18	115	44	54
Twentieth Century	July 23	Sept. 13	110	40	70
Gold Rain	do	do	110	40	66
Climax	July 22	do	110	43	61
Hybrid No. 36	do	do	110	40	53
Leader	July 24	Sept. 17	114	41	71
Abundance	do	do	114	42	59
Disco	July 21	[1]		46	
Hybrid No. 51	do	[1]		46	

[1] In the hard-dough stage Sept. 17.

[2] In the soft-dough stage Sept. 17.

Flax.—Agricultural statistics compiled by the United States Department of Agriculture (*18, p. 659*) show that the production of flaxseed in the United States is far below the demand and that a large quantity is annually imported. It is believed that the production of an early, high-yielding variety of flax might make it possible to market the seed at a profit in the States. With this purpose in mind, a variety test was begun at the Matanuska station in the spring of 1930. Flaxseed of 155 different varieties was received from the Bureau of Plant Industry, United States Department of Agriculture. On May 26 the seed of each variety was sown in rows 17 feet long and 1 foot apart, and by June 4 the seedlings had emerged. The plants grew rapidly throughout the season. The blooms for the different varieties appeared from July 20 to July 25. At the end of the growing season the seeds of the earliest varieties were well formed but still very green. None of the varieties matured seed. The height of the plants ranged from 16 inches to 48 inches. The latter part of the summer in the Matanuska Valley was unusually cool and wet. During normal seasons some of the earliest varieties probably would mature seed and yield satisfactorily.

POTATOES

Four varieties of potatoes were planted on 1½ acres of land that had been plowed in the fall and previously planted with a mixture of oats, peas, and vetch. Preparatory to planting in the spring the ground was double-disked and harrowed to a level surface. The seed potatoes were immersed for one and one-half to two hours in a solution of formaldehyde (1 pint of 40 per cent formalin to 30 gallons of water) for scab control. The potatoes were then removed from the bath, distributed in thin layers in the benches in the propagating house and exposed to the sunlight to sprout. When the sprouts were about one-eighth of an inch long the seed potatoes were cut in pieces each having at least two eyes and were planted May 23 with a horse-drawn planter. Some of the varieties developed black-heart under propagating-house conditions. White Bliss was less susceptible to the disease than were the other varieties tested. The young plants had emerged by June 26. The field was cultivated four times and the plants were hilled up at the last cultivation. The rows were hoed to kill weed growth. White Bliss blossomed July 20 and yielded at the rate of 184 bushels per acre. Early Ohio blossomed July 31 and yielded at the rate of 223 bushels per acre. Netted Gem produced a few blossoms and yielded at the rate of 149 bushels per acre. All the varieties except Netted Gem made a heavy vine growth. The plants were killed by frost September 17, and the crop was harvested September 22 and 23 with a horse-drawn potato digger. The potatoes were hauled to the root cellar, weighed, and graded.

Farmers in the Matanuska Valley this year planted a total of 48 acres to potatoes. The estimated crop for the region is 288 tons.

ROOT CROPS

Eight varieties of stock beets were planted in rod rows May 27. The planting was repeated three times. The young plants emerged from June 10 to June 14, and were harvested September 24. The varieties, in the order of their success, were Giant Red Eckendorf,

Heavy Cropper, Giant Half Sugar, Yellow Giant, Gatepost, Sludstrup, Golden Tankard, and Mammoth Long Red.

Two varieties of carrots, sown May 27, emerged June 18, and were harvested September 24. Improved Long Orange yielded nearly twice as heavily as White Belgian.

Petrowski turnips were planted May 27. The young plants emerged June 14, and the crop was harvested September 24. Petrowski produced a heavier yield than did any of the other root crops.

Purple Top Yellow rutabagas sown May 27 emerged June 19. Harvesting was done September 24. The yield was approximately half as much as that produced by the Petrowski variety of turnip.

PEAS FOR CANNING

Yields of peas for canning were determined by the square-yard method of Arny and Steinmetz (*3*). The peas were shelled by hand. The average yield of 9 samples was at the rate of 2,978 pounds per acre. When graded to meet the standard requirements of size suggested by Hunn (*10, p. 19*), 24 per cent of the peas were classed

FIGURE 4.—Peas and oats for silage, Matanuska station

as grades 1 and 2, 66 per cent as grades 3 and 4, and 10 per cent as grades 5 and 6. In an experiment begun to determine the optimum date for planting peas for canning, the Alaska variety was first planted May 28 and then at consecutive weekly intervals until September. The peas planted May 28 and June 4 developed to the proper stage for canning. All the others made vegetative growth, but failed to reach the optimum stage for canning.

FORAGE CROPS

Peas and oats in the ratio of 40 pounds of peas to 90 pounds of oats per acre were sown for silage. The first seeding was completed May 29 and the last June 7. Favorable weather caused the crops to make such a vigorous growth as to necessitate cutting them one way with a mower. (Fig. 4.) They were piled in small cocks by hand and later run through the cutter. The silo was filled without the material being spread or trampled on. Last year this method was

used with favorable results. Twenty-five acres produced at the rate of 6½ tons of green silage material per acre. One small field yielded at the rate of 10 tons per acre. Woodward (*20, p. 541*) reports that similar results, under similar methods, were obtained by the United States Bureau of Dairy Industry at Beltsville, Md., in the fall of 1926 and 1927.

Leader oats and common vetch (*Vicia sativa*) in the ratio of 90 pounds of oats to 30 pounds of vetch per acre were sown for hay. Prior to being planted the oats were treated with formaldehyde to prevent smut, and the vetch seed was inoculated because the field had never before been seeded with vetch. The first cutting was made August 16. The crop had to be cured by being cocked on spruce stakes on account of wet weather. These stakes were 9 feet long, sharpened on both ends, and driven 2 feet into the ground. Tenpenny nails were driven partly into the stakes 18 inches above the ground to hold the lower layers off the ground and to permit the air to circulate around the bottom of the cocks. (Fig. 5.) The

FIGURE 5.—Oats and vetch hay in cocks, Matanuska station

green material was piled on with pitchforks. The yield of cured hay was 2 tons per acre. On account of the almost continuous wet weather the rest of the crop was cut for silage the latter part of the month.

Twenty-four varieties of perennial leguminous field crops and 15 varieties of grasses were seeded in test plats to determine their winter hardiness and adaptability to local conditions. All the varieties grew vigorously and went into the winter in good condition.

HORTICULTURE

The orchard.—Of the fruit trees set out in the newly established orchard in the spring of 1929, only a comparatively small percentage was alive in the spring of 1930. The percentages surviving were for apple trees, 27; apple seedlings, 8; plum trees, 8; plum seedling and mulberry trees, 0; cherry trees, 16; pear trees, 4; and raspberry plants, 48. Strawberry plants survived 100 per cent, currant plants

86 per cent, and gooseberry plants 55 per cent. Only one grapevine survived.

The hardier varieties of apple trees under trial are Dolgo crab, Whitney crab, and Erickson. Zumbra cherry was hardier than the other varieties tested. Examination of the fruit trees found dead in the spring of 1930 showed that they had developed little or no new root growth during the summer of 1929. It is thought that after the roots have become well established the hardier varieties can be grown with little difficulty.

Ornamental shade trees.—A number of ornamental shade trees, including ash, maple, boxelder, catalpa, locust, elm, and walnut, were planted but made comparatively little growth.

ROTATION PLATS

Three new series of crop-rotation plats were laid out in the spring of 1930. (Fig. 6.) The series comprise a 6-year rotation, a 5-year rotation, and a 3-year rotation. The 6-year rotation includes a perennial hay and pasture crop, an annual hay crop, a root crop, and two grain crops. Manure is to be applied after the hay and pasture crop has been harvested the second year. The 5-year rotation includes a green-manuring crop, a silage crop, a cultivated crop, and two grain crops. No manure is to be applied to this series. The 3-year rotation includes a pea crop followed by application of manure, an annual hay crop, and a grain crop. The plats are on the uppermost bench northwest of the station buildings, and are numbered from 1 on the east side to 66 on the west side. The individual $\frac{1}{30}$-acre plats are 121 feet long and 12 feet wide. Their longest dimensions extend north and south. The alley between any two adjacent plats is 2 feet wide. Each plat has two duplicates. Table 7 shows the scheme of rotation.

FIGURE 6.—Seeding crop rotation plats, Matanuska station

TABLE 7.—*Cropping scheme in a series of rotations at the Matanuska station*

Plat numbers	Crops planted in 1930
SIX-YEAR ROTATION	
1—23—45	Bromegrass, alsike clover, and white clover.
2—24—46	Do.[1]
3—25—47	Oats and vetch.
4—26—48	Turnips.
5—27—49	Oats.
6—28—50	Barley with bromegrass, alsike clover, and white clover.
FIVE-YEAR ROTATION	
7—29—51	Peas for green manuring.
8—20—52	Oats and peas.
9—31—53	Potatoes.
10—32—54	Barley.
11—33—55	Oats.
THREE-YEAR ROTATION	
12—34—56	Peas for canning.[1]
13—35—57	Oats and vetch.
14—36—58	Barley.
CONTINUOUSLY TO SAME CROP	
15—37—59	Bromegrass, alsike clover, and white clover.
16—38—60	Potatoes.
17—39—61	Turnips.
18—40—62	Oats and peas.
19—41—63	Oats and vetch.
20—42—64	Oats.
21—43—65	Barley.
22—44—66	Peas for canning.

[1] Manure is to be applied after the crop is harvested.

Manure when used was applied at the rate of 10 tons per acre in the fall before plowing was done. The yield of turnips this year was exceptionally low, because the first planting of May 22 did not germinate and replanting had to be done July 7.

CATTLE

The Holstein herd numbers 1 herd bull, 8 cows, four 2-year-old heifers, and 1 bull calf. The milk records of the herd show that the cows are all above the 10,000-pound average. The hybrid Galloway-Holstein herd numbers 1 herd bull, 10 cows, eight 2-year-old heifers, 3 yearling heifers, and 4 calves. Table 8 gives the monthly milk yields of the cows of both herds for the year ended September 30, 1930.

TABLE 8.—*Record of production of 7 Holstein and 10 Galloway-Holstein cows at the Matanuska station*

Breed and cow	Yield of milk in 1929			Yield of milk in 1930								
	October	November	December	January	February	March	April	May	June	July	August	September
Holstein:	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*
No. 13	654.6	549.1	526.5	318.0	------	------	445.7	870.5	780.0	854.3	444.5	------
No. 23	772.1	564.6	493.4	214.5	------	1,484.0	1,572.9	1,562.7	1,592.8	1,558.0	1,332.9	1,116.8
No. 24	927.6	757.3	749.1	704.6	565.1	393.6	185.9	------	635.9	1,405.6	1,194.1	960.0
No. 26	614.7	470.2	339.9	------	567.7	1,540.3	1,087.1	1,128.1	1,177.0	1,100.7	862.2	609.2
No. 28	775.9	660.6	680.5	526.7	250.5	------	507.4	1,233.0	1,199.5	1,277.3	1,064.1	883.6
No. 29	360.6	173.4	28.8	527.2	956.4	846.9	807.6	797.7	772.7	718.1	603.4	543.7
No. 37	------	------	------	------	------	------	------	------	------	------	137.6	781.0
Galloway-Holstein:												
No. 16	------	------	------	------	1,132.6	1,594.3	1,397.8	1,520.2	1,522.9	1,354.8	1,141.7	897.5
No. 31	1,304.8	1,118.4	1,014.2	963.0	815.6	773.5	744.8	781.4	745.0	763.2	635.2	441.5
No. 39	195.4	296.5	266.5	157.3	------	------	1,050.7	1,290.5	706.9	870.0	512.8	430.0
No. 41	------	------	------	102.0	1,549.4	1,636.3	1,436.6	1,523.3	1,500.2	1,376.4	1,180.8	817.3
No. 42	747.4	682.5	753.4	814.3	634.8	709.2	668.8	773.4	770.5	656.0	250.5	------
No. 44	265.8	87.1	------	------	651.0	998.4	805.9	887.6	803.5	764.2	678.5	546.4
No. 45	313.6	240.9	99.5	------	------	------	539.1	1,257.4	1,121.2	1,094.0	842.2	667.1
No. 62	551.7	512.1	566.2	600.0	530.2	527.8	545.8	621.9	607.8	570.7	397.4	34.1
No. 65	486.1	430.2	462.6	430.3	354.7	399.4	362.9	481.4	376.6	494.0	256.6	351.6
No. 67	------	------	------	1,238.9	1,112.1	1,128.1	965.2	1,048.6	1,015.3	948.9	843.0	701.9

Table 9 gives a comparison in yield of milk and butterfat of five Holstein and eight Galloway-Holstein cows at the Matanuska station, 1930.

TABLE 9.—*Record of production of five Holstein and eight Galloway-Holstein cows at the Matanuska station during one lactation period*

Breed and cow	Lactation		Total milk yield	Daily average milk yield	Butterfat	
	Number	Period				
Holstein:		*Days*	*Pounds*	*Pounds*	*Per cent*	*Pounds*
No. 29	1	343	7,158.8	20.87	3.6	257.70
No. 28	1	365	9,256.9	25.36	3.7	342.50
No. 26	2	278	8,365.1	30.09	3.8	317.80
No. 23	3	365	12,035.3	32.97	3.7	445.30
No. 24	3	365	12,371.0	33.89	3.5	432.90
Galloway-Holstein:						
No. 62	1	365	7,550.7	20.68	4.4	332.23
No. 65	1	365	6,540.7	17.91	4.3	281.25
No. 42	2	365	10,555.1	28.92	4.5	474.97
No. 43	2	204	3,776.4	18.51	4.0	151.05
No. 44	2	321	5,855.8	18.24	4.9	286.93
No. 45	2	332	6,704.1	20.19	4.9	328.50
No. 16	5	156	8,675.7	55.61	4.5	392.67
No. 31	5	365	10,100.6	27.67	4.0	404.02

Galloway-Holstein cows Nos. 16, 31, and 42 held the highest records of the crossbreed in butterfat production. Cow No. 16 was milked during only 156 days. She foundered accidentally and dried up. Cow No 42 produced approximately 480 pounds of butterfat. Holstein cow No. 23 produced approximately 445 pounds of butterfat. The best Galloway-Holstein cow surpassed the best Holstein in butterfat production.

Table 10 gives a comparison of the milk and butterfat, in the first 100 days after the beginning of their respective lactation periods, of each of five Holstein and five Galloway-Holstein cows.

TABLE 10.—*Record of production of five Holstein and five Galloway-Holstein cows for 100 days at the Matanuska station in 1930*

Breed and cow	Date of birth	Lactation		Milk produced	Daily average yield	Butterfat
		Number	Date began			
Holstein:				*Pounds*	*Pounds*	*Per cent*
No. 29	June 1, 1925	2	Jan. 17	3,036.8	30.36	3.3
No. 28	Aug. 9, 1925	2	Apr. 17	3,972.4	39.72	3.2
No. 26	Nov. 18, 1924	4	Feb. 19	4,406.8	44.06	3.4
No. 23	Nov. 15, 1923	4	Mar. 6	5,318.5	53.18	3.4
No. 13	May 23, 1920	6	Apr. 17	2,781.5	27.81	2.8
Total				19,516.0		
Average					39.00	3.2
Galloway-Holstein:						
No. 67	June 1, 1927	1	Jan. 1	3,816.6	38.16	3.5
No. 44	May 2, 1925	3	Feb. 7	3,025.3	30.25	4.4
No. 45	May 5, 1925	3	Apr. 15	3,718.8	37.18	4.1
No. 41	Sept. 17, 1924	3	Jan. 30	5,144.2	51.44	4.0
No. 16	Apr. 22, 1921	6	Feb. 6	4,872.0	48.72	3.5
Total				20,576.9		
Average					41.15	3.9

When their ages are considered the Galloway-Holsteins are found to be consistently better milk and butterfat producers than the Holsteins. Occasional reversion to low milk production by the progeny of certain of the crossbred animals can be expected until the type is fixed.

A feeding test was made comparing the ability of 12 dairy cows to make gains on locally grown feeds during the winter and on pasture during the summer. The period began November 1, 1929, and ended September 30, 1930. Table 11 gives the results of the test.

TABLE 11.—*Record of weights and gains of four Holstein and eight Galloway-Holstein cows on locally grown feeds during the winter and on pasture during the summer*

WEIGHT DURING THE WINTER, 1929–30

Breed and cow	Age of cow at beginning of the test	Nov. 1	Dec. 1	Jan. 1	Feb. 1	Mar. 1	Mar. 31	Total gain	Average monthly gain
Holstein:	*Days*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*
No. 38	370	580	600	640	660	725	740	160	32
No. 39	293	545	570	610	640	690	730	185	37
No. 41	221	415	435	480	500	605	605	190	38
No. 42	217	360	395	440	500	545	610	250	50
Galloway-Holstein:									
No. 68	853	1,150	1,150	1,160	1,210	1,235	1,275	125	25
No. 71	813	1,090	1,090	1,110	1,160	1,155	1,170	80	16
No. 77	698	845	860	900	920	895	975	130	26
No. 80	452	750	770	790	810	820	890	140	28
No. 82	359	575	590	640	670	785	730	155	31
No. 87	231	330	360	420	470	535	580	250	50
No. 88	217	290	320	370	415	480	560	270	54
No. 90	205	320	345	400	450	505	560	240	48
Total gain								2,175	435
Average per cow								181.2	36.2

TABLE 11.—*Record of weights and gains of four Holstein and eight Galloway-Holstein cows on locally grown feeds during the winter and on pasture during the summer.*—Continued.

WEIGHT DURING THE SUMMER, 1930

Breed and cow	Age of cow at beginning of the test	May 1	June 1	July 1	Aug. 1	Sept. 1	Sept. 30	Total gain	Average monthly gain
Holstein:									
No. 38	370	770	750	800	855	900	995	225	45
No. 39	293	745	760	780	880	885	960	215	43
No. 41	221	630	645	710	770	790	860	230	46
No. 42	217	630	640	655	705	725	780	150	30
Galloway-Holstein:									
No. 68	853	1,275	1,220	1,290	1,315	1,370	1,440	165	33
No. 71	813	1,185	1,160	1,160	1,220	1,255	1,290	105	21
No. 77	698	920	920	945	975	975	1,070	150	30
No. 80	452	870	890	920	980	1,000	1,055	185	37
No. 82	359	745	730	800	830	870	955	210	42
No. 87	231	640	640	705	745	770	820	180	36
No. 88	217	510	570	620	680	680	735	225	45
No. 90	205	630	605	670	720	730	790	160	32
Total gain								2,200	440
Average per cow								183.3	36.6

April and October were not included in the records of results because the animals were partly fed and partly pastured during these months. Silage fed at the rate of 30 pounds and oat-pea hay at the rate of 12 pounds per 1,000 pounds of body weight constituted the daily ration from November to April for cows 1 year old or over. Animals under 1 year old were fed daily 1 pound of a concentrated mixture consisting of equal parts by weight of ground oats and ground barley in addition to the hay and silage. The average gains made by the animals during the winter approximated those made on pasture during the summer.

The young animals made greater gains on the winter ration than on pasture because they received the concentrates in addition. The animals as a group gained approximately as much during the winter as they did during the summer.

HOGS

The Hampshire hogs at the station were maintained during the winter in individual houses. This method was satisfactorily followed until farrowing time. The sows farrowed in a stall of the horse barn. One of the three litters farrowed lived. This litter when 2 weeks old was placed with the mother in an individual house. (Fig. 7.) Plans are being considered for the erection of a warm hog house having adequate facilities for farrowing.

The boar was fed a maintenance ration of oats, barley, vetch hay, and slops from November 1 to June 1, when the grain ration was reduced to 1 pound daily as a supplement to pasture. Pasture was available June 1. Oats, peas, and rape were satisfactorily pastured until September 5. The rape and the peas had been grazed thoroughly by that date, and the oats had reached an advanced stage of maturity and made a poor pasture.

One litter of three sows and four barrows, born April 22, was turned on a ½-acre pasture July 1. The barrows averaged 41.5 pounds each and the sows 48 pounds each. Sown May 15 in a mixture for pasture, oats, peas, and rape stood 6 inches high July 1.

At the time the pigs were placed on pasture the field was overrun with lamb's-quarters (*Chenopodium album*), which stood as high as the oats. The weed was relished by the pigs and soon was grazed to the ground. Daily observations showed that after they had completely grazed the weed, the animals preferred the young peas and the rape to the oats. Each pig received daily, in addition to the pasture, approximately 2 pounds of skim milk and 1 pound of a grain mixture composed of ground barley and oats.

The peas and the rape had been closely grazed by September 15, and the oats was maturing. The grain supplement was increased to 2 pounds daily per pig and the skim milk to 3 pounds. The barrows averaged 97.5 pounds each in total weight, and the sows, 106.6 pounds each. Thus, 77 days after they were turned on pasture, the barrows showed average gains of 56.5 pounds each, and the sows, 58.6 pounds each. On October 15 the barrows averaged 106.2 pounds and the sows, 120 pounds. During the 30-day period, September 15–October

FIGURE 7.—Sow and litter of Hampshire breed, Matanuska station

15, the barrows increased 8.7 pounds in weight, and the sows 13.4 pounds.

As a result of this preliminary trial, it is concluded that (1) the pigs were too young July 1 to make full use of pasture; (2) the carrying capacity of the pasture was too small and the animals grazed the peas and the rape too closely in consequence; and (3) the pasture after September 1 should include barley. Either separate lots containing peas and barley should be available, or the pasture should be of sufficient size to enable the animals to obtain plenty of feed therefrom. This would preclude the necessity of close grazing and allow the crops to set seed.

One boar, one sow, and two gilts will be carried over the winter of 1930–31.

SHEEP

Twelve ewes and one ram were shipped from the station to the range land near Healy October 1, 1929. The sheep ranged during the day and were kept in a barn at night to safeguard them from wolves. The weather permitted ranging all winter except for 38

days. During the time the sheep were kept in the barn they were fed approximately 1 ton of native hay and 300 pounds of rolled oats. Facilities for lambing were inadequate, and only four of the six lambs dropped during the year lived. Six of the ewes failed to breed, probably because of the poor condition of the ram. The results of the range test indicate that sheep may profitably be ranged in the Healy district if they are provided with proper sheds and a small amount of native hay for use during inclement weather and at lambing time. Native grasses are available for hay, and oats will make sufficient growth for use as hay. In the fall of 1930 three farmers in the Matanuska Valley owned 221 sheep.

POULTRY

Fifty Buff Leghorn hens and four cockerels were wintered in a small chicken house without artificial heat. The interior of the house was hard to keep dry during extremely cold weather because ice crystals formed on the floor and the ceiling. The flock produced 396 dozen eggs from October 1, 1929, to September 30, 1930.

FIGURE 8.—Yak and yak-Galloway hybrids near Healy

YAK

Beginning with the summer of 1930, the yak were placed under the supervision of the animal husbandman of the Matanuska station. A pair of yak was first shipped to the Fairbanks station in 1919 for reciprocal crossing with the Galloway cattle. The yak cow proved to be a nonbreeder. Seventeen yak-Galloway calves have been sired by the yak bull out of the Galloway cows. Two additional yak cows were obtained in 1923. One of these was found to be sterile, and the other died of plant poisoning. In December, 1929, three yak heifers and a young yak bull were shipped to the Fairbanks station from the Canadian Parks Service. From the time of their introduction in 1919 to the summer of 1930, the animals were kept on the station reserve at Fairbanks. In August, 1930, the herd, numbering 2 yak bulls, 3 yak cows, 1 heifer calf, 1 bull calf, 1 hybrid bull calf, and 6 female hybrid cows (fig 8.) was moved from Fairbanks to the bunch-grass range in the vicinity of Healy and Lignite,

where the elevation is 1,500 feet. It was thought that the animals would thrive better there than at Fairbanks because the location more nearly approximates that of their native habitat in Tibet. Arrangements were made to have the animals range in the open during the winter as much as possible and to give them a supply of hay in case the weather prohibited grazing. The animals showed marked improvement within 60 days after their transfer to the new region. Their coats gained added luster, their hoofs resumed the natural shape, and the males lost some of their surliness. All the animals were more active and alert than formerly.

SOIL STUDIES

A test was made to determine the soil acidity of representative areas on the station reserve. Part of the area on the west side of the road lies in three distinct benches. For the sake of convenience these benches were numbered beginning from the south side. Samples were taken from virgin timberland and from land that had been under cultivation from one to nine years. The depth of the soil from the surface to the underlying gravel was determined. Samples taken from a depth of 6 inches were tested for acidity. The results are given in Table 12.

TABLE 12.—*Results of testing cultivated and uncultivated land at the Matanuska station for acidity*

CULTIVATED LAND

Sample No.	Location	Period under cultivation	Crops planted in 1930	Depth of soil sample	Degree of acidity
		Years		*Inches*	
1	Bench No. 1	5	Oats and vetch	25	Medium.
2	Hillside	7	Grass	22	Very slight.
3	Bench No. 2	8	Grain	31	Medium.
4	do	8	Oats and peas for silage	24	Do.
5	Hillside	9	Slender wheatgrass	19	Very slight.
6	Bench No. 3	6	do	17	Slight.
7	do	5	Grain	23	Medium.
8	do	1	Oats and peas	29	Do.

UNCULTIVATED LAND

9	Bench No. 1		None	29	Medium.
10	do		do	25	Do.
11	Bench No. 3		do	26	Do.
12	do		do	34	Very strong.

The area from which sample No. 9 was taken had been slashed in 1929. The areas from which samples Nos. 10 and 11 were taken are covered with birch and spruce timber. Sample No. 12 was taken from an area on which spruce trees predominate. The soils in the different places varied in degrees of acidity designated by Truog (*19, colored chart*) as very slight acid to very strong. Cultivated soils were less acid than timbered soils. Timbered soils on which a growth of birch predominated were less acid than soils on which spruce was growing. Timbered soil overlain with moss was found to be strongly acid. On a small area of muskeg soil on bench No. 1, the moss

overing was found to be 22 inches in thickness. Frozen soil was ound 26 inches below the top of the moss September 25, 1930. Between the moss and the layer of frozen soil there was a layer of thawed soil 4 inches deep which was medium acid in reaction.

LAND CLEARING

During the winter of 1929–30, 51 acres were slashed, the trees felled in windrows. Some of the material was salvaged for use as fuel and fence posts, and the rest was left to be burned. On 10 acres that previously had been slashed the stumps were pulled by means of a tractor equipped with a double drum hoist carrying 500 feet of plow-steel cable five-eighths of an inch in diameter as a main line, and 1,000 feet of cable three-eighths of an inch in diameter as a haul-back line. The large stumps were first loosened and split with dynamite. A crew of four men did the work.

Trees of each species in a 4.5-acre field east of the station buildings were counted. This field had been slashed in November, 1928. The area was found to contain 1,769 trees, an average of 393 per acre. Only such stumps as had a diameter of 2 inches or more at 3 feet above the ground were measured. Willows appear to mature at 6 inches in diameter. Trees of greater diameter usually had dead tops with branches rising from adventitious buds on the sides of the trunk. Dynamite (40 per cent strength) had to be used to loosen stumps 5 inches or over in diameter. One stick of dynamite was required for birch stumps 5 to 7 inches in diameter; two for stumps 8 to 10 inches in diameter; and three for stumps 11 inches or over in diameter. One was required for spruce stumps 5 to 6 inches in diameter; two for stumps 7 to 10 inches in diameter; three for stumps 11 to 12 inches; and four for stumps 13 inches or over. Five sticks of dynamite weigh approximately 1 pound. Table 13 shows the number of each kind of tree in the field, and the diameter of the trees.

TABLE 13.—*Number, kinds, and diameter of trees on a 4.5-acre field at the Matanuska station*

Diameter	Kind of tree					
	Birch	Spruce	Aspen	Willow	Alder	Cotton-wood
Inches	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*
2	51	1	1	8	57	
3	89	16	9	12	74	
4	73	64	10	12	39	
5	88	65	12	11	18	
6	84	52	34	12	5	
7	62	44	22	11	1	
8	90	80	20	10		
9	73	57	11	8		1
10	51	57	12	8		
11	57	38	4	1		
12	55	32	7	9		2
13	10	5	1	1		
14	3	8				1
15	2					
16	2	1				
17	1					1
18	1					
19						
20						1
21						
22						
23						1
	792	520	143	103	194	7

An area of about 4 acres northwest of the station buildings was slashed during the winter of 1929–30. Firing was done May 3, when the northeast wind was strong and the humidity relatively high. The results were very poor, only half the windrows burning. Better results are obtained when burning is done about five weeks later.

One south-slope pasture northeast of the station buildings is rapidly growing up to willows. The area was cleared in the summer of 1925 and seeded with grass in the spring of 1926. A count of willow clumps on a representative area of 1,000 square feet was made May 9, before elongation of twigs began. Twelve clumps were found. These had 7, 9, 11, 12, 14, 15, 18, 20, 23, 24, 25, and 27 shoots, re-

FIGURE 9.—Clump of willows at Matanuska station

spectively. The shoots in one clump were found to be respectively 35, 37, 72, 76, 78, 86, 89, 98, 103, 105, 107, 112, 116, 132, and 132 inches high. (Fig. 9.) They attained this growth in four seasons.

BUILDINGS AND IMPROVEMENTS

An office building, an implement shed, and a workshop were erected during the summer. The office building is a frame structure 24 by 34 feet, 1½ stories high, with a concrete basement. The main floor contains five rooms which will be used as an office and library and for storage purposes. The upper part of the building is also to furnish storage. The basement contains a furnace and a fuel room, a drying room, and a photographic and laboratory room. The building is equipped with a hot-water furnace.

The implement shed is a concrete structure 24 by 70 feet, one story high. The basement, which extends only under a part of the east end, is large enough for use as a stove and a fuel-storage room. The footings for the walls were sunk 8 feet into the ground so as to extend below the frost level. The concrete walls are 6 inches thick, with reinforcing extended to the eaves. The roof is of 18-gage galvanized iron. The building is equipped with ventilators. In the west end of the building are housed the electric-light plant and the fire apparatus. The east 15 feet was partitioned off with a concrete wall as a room for repairing machinery. The emery wheel, grindstone, drill press, and other devices were placed in this room. The floor of the building is of reinforced concrete 4 inches thick, poured in sections. A 1-inch space filled with tar was left at 15-foot intervals to provide for the expansion and the contraction caused by extremes of temperature. In the large central room are stored tractors, trucks, and implements. Three pits, one in the east room and two in the large central room, provided with heating facilities, will be used for repair work on trucks and machinery. Each pit is connected by a pipe to the stove in the basement at the east end of the building. This arrangement permits warming the motors of tractors or trucks in cold weather and obviates the necessity of heating the entire building. The building extends east and west and has an ample number of windows on the south side.

The workshop is near the propagating house. It is a frame structure 18 by 24 feet, with a concrete basement, and contains on the first floor three work rooms for agronomic and horticultural projects. The basement contains a furnace room, a fuel room, and a pump room. The well is directly under the pump room in which are an air compressor and a gasoline engine. A hot-water boiler installed in the furnace room provides heat for the propagating house.

The well dug last year was completed in 1930. It is 39 feet deep. At this depth the water came in too fast to be pumped out rapidly enough for further digging. Water was struck at 32 feet. When digging was completed early in the summer, the water stood 6 feet deep in the well. Later in the summer the water rose to 10 feet, where it has since remained. Sectional cement tubings 3 feet in inside diameter were used instead of wooden curbing to line the well. Each unit was 3 feet long and 3.75 inches thick, and weighed approximately 800 pounds. The workmen dug a hole deep enough to hold the first section, and thereafter worked inside the casing, letting the sections settle by their own weight as the earth was removed. As one section sank, another was placed on top of it to form one continuous cement tube.

A pipe 1½ inches in diameter, connecting all main buildings, was laid 18 inches below the surface of the ground to form a conduit for lead-covered electric-light and telephone wires.

A porch 5 by 15 feet was added to the north end of the north cottage, and a porch 6 by 15 feet to the north end of the mess house. The south cottage was completed this year and is now occupied by the

horticulturist. (Fig. 10.) The barn, the two silos, and the milk house were painted, and a galvanized-iron roof was built over the manure pit.

FAIRBANKS STATION

WEATHER CONDITIONS

The fall of 1929 was favorable for harvesting and plowing. Snow covered the ground early in October, but the soil did not freeze hard enough to stop plowing until November 15, when it froze to a depth of 3 inches. Mild weather continued until December 6, when strong winds blew for two days. The latter part of December had a minimum temperature of −47° F. Temperatures during January were somewhat higher, with a minimum of −30°. February was the coldest

FIGURE 10.—South cottage, Matanuska station

month, with a minimum temperature of −45°, a mean maximum of −6.7°, a mean minimum of −25°, and a mean of −16°. The first part of March was mild, and was followed by very cold weather. On March 13 and 14 strong winds caused the snow to drift badly in exposed places. The latter part of March was mild, the temperature rising to 50° on March 28. The early part of April was characterized by cool, unsettled weather. Mild weather followed. Only 4 inches of snow remained on the south-slope lands April 18, and it had disappeared by April 24. The growing season of 1930 was characterized by a cold, wet spring, a very dry July, and a rainy fall. During August, 7.98 inches of rain fell. The last killing frost of the spring

on the south-slope lands occurred May 20, and the first killing frost of the fall, September 12. The frost-free period was 115 days. During the first part of May the soil was too wet for farming operations. The weather was better from May 10 to May 17, and the ground dried rapidly. The south-slope land was prepared for seeding May 11. Rainy weather during the latter part of May and the early part of June delayed the spring planting considerably. June was cool and wet and in consequence the crops grew slowly. Dry weather during July materially checked the growth and yield of all the crops. The quality of potatoes was improved, but the yield was materially reduced. The first killing frost of the fall occurred in the lowlands August 13. Hay crops lodged during the cool, wet weather of August and September.

GRAIN CROPS

Spring wheat.—Spring wheat of the variety Siberian No. 1 was sown on 2.14 acres of south-slope land June 10. The seed bed was well prepared and the young plants emerged by June 20. Growth was slow, and the plants were yellow to pale green and only 15 inches high at the time of heading, July 18. Chlorosis may have been caused by a deficiency of available nitrates in the soil. Ripening was retarded by the wet fall. The kernels were in the soft-dough stage August 29. Cool, wet weather in September caused harvesting to be delayed until October 2. Threshed October 21, the variety yielded at the rate of 11.5 bushels per acre. The kernels had a moisture content of 19.8 per cent at the time of threshing. Seed grain with such a high moisture content at threshing time can hardly be expected to remain viable throughout the winter. Ruby is an early variety of spring wheat, but the heads fill poorly at the tips, and the yield is materially reduced in consequence. This year Ruby on 1.23 acres of south-slope land failed to ripen. The variety was headed by July 23 at a height of 20 inches, and was in the soft-dough stage by August 29. Unfavorable weather and poor soil resulted in small heads, poorly filled.

Oats.—Canadian, the variety of oats recommended for this region, was sown May 29 on 1.9 acres of south-slope land. The seedlings had emerged by June 12. Growth was slow, and at the time of heading, July 19, the plants were only 18 inches high and poor in color. The grain was in the dough stage August 29. It was harvested October 2, and threshed October 22, yielding at the rate of 28 bushels per acre. The moisture content of the grain at the time of threshing was 19.5 per cent, which is high for seed grain. In this latitude seed grain must be dry if it is expected to endure the extreme low temperatures of winter.

Barley.—Trapmar, a hooded, hull-less variety of barley which was developed at the Rampart station, is recommended for this region. It is early and usually yields well. This year the yield and quality of grain were poor, probably because of the unfavorable growing season. The variety was sown June 9 on 1.6 acres of south-slope land. The resultant plants had emerged by June 17. The variety grew slowly, headed unevenly, and at the time of heading, July 25, was 16 inches high. It was in the hard-dough stage August 29, and was harvested October 2. Threshed October 22, it yielded at the rate of 12.7 bushels per acre (48 pounds per bushel). The grain had a moisture content of 22.5 per cent at the time of threshing.

Winter rye.—Hogot winter rye was sown July 11, 1929, on a 0.65-acre plat of south-slope land. The fall growth was vigorous, and the rye was in strong condition at the end of the season. Practically none of the crop winterkilled, and it grew rapidly in the spring of 1930. The first heads appeared June 12, when the plants were 33 inches high. The rye was fully headed June 27 at a height of 40 inches and was in bloom June 27 at a height of 60 inches. The crop was harvested August 9 at a height of 66 inches. Because of the rainy season, it was not threshed until October 20. It yielded at the rate of 14 bushels per acre. The grain had a moisture content of 17.8 per cent at threshing time. Hogot winter rye (fig. 11) is the hardiest winter grain that has been grown at the station. Emerald winter rye, received from the Minnesota Agricultural Experiment Station, survived the winter and gave a stand of 90 per cent.

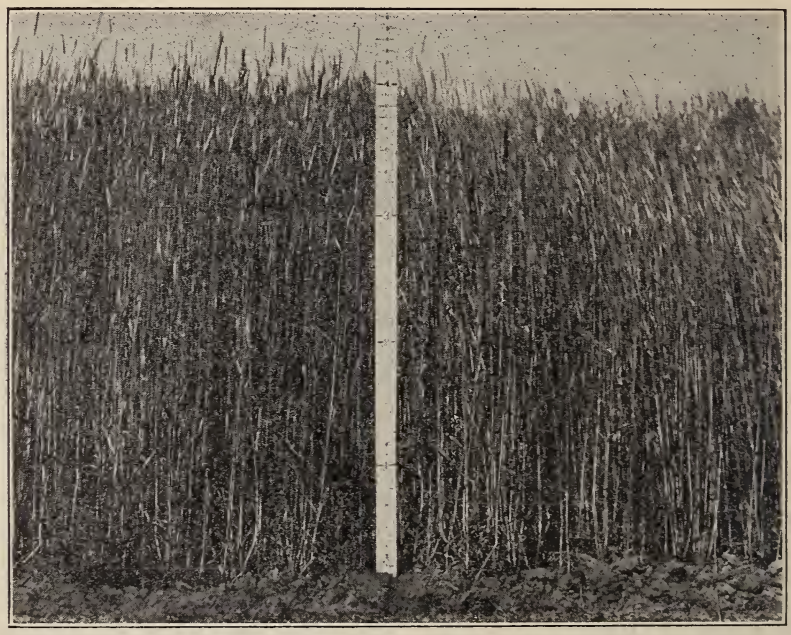

FIGURE 11.—Hogot winter rye, Fairbanks station

Hay production.—Canadian oats for hay was seeded May 30 on south-slope land. It had emerged by June 11 and had headed by July 16 at a height of 22 inches. When harvested the plants were 30 inches high. The cloudy and rainy weather caused the crop to lodge. This interfered with haymaking. Most of the crop was cut with a grain binder during the latter part of September and dried in small, uncapped shocks consisting of 8 to 10 bundles. The air-dried yield was at the rate of 2 tons per acre.

POTATOES

Irish Cobbler, planted May 21 on one-fourth acre of south-slope land which was treated at the rate of 800 pounds per acre with a 5:6:8 (nitrogen, phosphorus, and potash) fertilizer combination, yielded at the rate of 236 bushels of marketable potatoes per acre. The quality was excellent. About three weeks before planting time

the seed potatoes were immersed for 30 minutes in a solution of corrosive sublimate (4 ounces to 30 gallons of hot water) for scab control, and then placed in a well-lighted room under a temperature of about 70° F. to sprout. Strong, green sprouts had developed by planting time. One-ounce seed pieces were planted. The resultant seedlings had emerged by June 12. They grew rapidly and were in bloom July 19. The dry weather of July was favorable for maturing potatoes. Rain in the fall delayed harvesting until September 18. The tubers were mealy when cooked. The same variety, planted June 10 on unfertilized land, yielded at the rate of 181 bushels per acre. The tubers did not mature and were watery when boiled. A test was made to determine the effect on yield of ridging the rows of potatoes. High ridging, low ridging, and level planting were practiced. The ridges were 9 inches and 4 inches high, respectively, measured from the bottom of the furrow between the rows. The rows were ridged July 19. The area on which high ridging was practiced yielded at the rate of 231 bushels per acre, that on which low ridging was practiced, at the rate of 248 bushels per acre, and that given level culture, at the rate of 232 bushels per acre.

FORAGE CROPS

Legumes.—Twelve varieties of legumes were tested for winter hardiness. It is a problem to find a legume that will not only withstand the rigorous winters of the Tanana Valley but will also come on early in the spring and grow rapidly enough during the short summer to provide a satisfactory yield of forage for livestock. Yellow-flowered alfalfa (*Medicago falcata*) and perennial vetch (*Vicia cracca*) are hardy enough, but they make slow growth and for that reason do not yield enough in the short season to be considered satisfactory forage crops. In the hope of finding a hardy, high-yielding legume for the Tanana Valley, a series of plats were seeded with several varieties of alfalfa and clovers in the spring of 1929. All the seed was well inoculated at the time it was sown. Excellent stands resulted, and all the plats were in vigorous condition in the fall of 1929. Table 14 gives the results of the test.

TABLE 14.—*Results of variety test of legumes seeded in the spring of 1929 at the Fairbanks station*

Crop	Proportion of plants surviving the winter	Date of first bloom	Height of plants at first bloom	Date of full bloom	Height of plants at full bloom	Date seed matured
Alfalfa:	*Per cent*		*Inches*		*Inches*	
Grimm [1]	98	June 21	15	July 12	22	(2)
Grimm No. 451 [3]	90	do	16	do	23	(2)
Ladak [4]	98	June 25	14	July 20	23	(2)
Sweetclover:						
Biennial white [1]						(2)
Arctic [3]	50			July 12	40	Aug. 13
Red clover:						
Medium [5]	5	June 19	10	do	18	Do.
Mammoth [5]	5	June 23	10	do	18	Do.
Russian No. 15179 [4]	80	June 19	15	do	30	Do.
Russian No. 15980 [4]	90	do	16	do	30	Do.
Russian No. 15757 [4]	90	do	15	do	28	Do.
Alsike clover: Common variety [5]	50	June 21	8	do	21	Do.
White clover: Common variety [5]	50	June 26	7	do	11	Do.

[1] Seed obtained from the Minnesota Agricultural Experiment Station.
[2] None matured.
[3] Seed obtained from the University of Saskatchewan.
[4] Seed obtained from the Bureau of Plant Industry, U. S. Department of Agriculture.
[5] Seed obtained from the Pacific Northwest.

The three varieties of alfalfa, one variety of sweetclover, and the three Russian clovers came through the winter in excellent condition. The alfalfa came on early in the spring and made rapid growth until it was checked by the dry weather of July. Grimm and Grimm No. 451 were in full bloom July 12 when 22 and 23 inches high, respectively. None of the varieties ripened seed. Arctic sweetclover proved to be much more hardy than the ordinary biennial white sweetclover. Although 50 per cent of the crop winterkilled, the surviving plants were strong and grew rapidly in the spring. By July 12 they were 40 inches high and in full bloom. Seed pods set abundantly, and the seed was ripe by August 13. The farmers of the interior need a rank-growing legume for rotating with grain and other cultivated crops to improve the soil and furnish forage for livestock. Arctic sweetclover appears to be promising for this purpose. The plats of Russian clover were outstanding in their winter hardiness as compared with those of the medium and the Mammoth red clovers. These Russian strains came through the winter with excellent stands and made rapid growth throughout the spring and the summer. By July 12 they were 28 to 30 inches high and in full bloom. The seed was ripe by August 13. The fact that they ripened seed in this region is of special significance, because the falls are usually cool and wet and most varieties of alfalfa and clover do not ripen seed here.

Bromegrass.—North-slope land which had become low in fertility and infested with weeds was seeded with a mixture of bromegrass, alsike clover, and white clover in the spring of 1929. The grass survived the winter in good condition, but the clover winterkilled. The growth during the summer of 1930 was short, but furnished sufficient pasture for livestock. A portion of the south-slope land which washes during the spring thaws was seeded with bromegrass in the spring. A fair stand resulted, and the grass was 10 inches high at the end of the growing season. Old stands of bromegrass on south-slope land were heading June 17 when 30 inches high. Native redtop grew rapidly in the spring and was fully headed June 25 when 36 inches high.

SOIL STUDIES

On October 8, 1929, a soil thermograph was installed in one of the alfalfa plats on south-slope land to obtain the temperature of the soil at the level of the alfalfa crowns, which lie approximately 1 inch below the surface of the ground. Table 15 gives a record of the depth of the snow, and the air and soil temperatures taken at weekly intervals throughout the winter.

TABLE 15.—*Record of the depth of the snow and of air and soil temperatures taken at weekly intervals at the Fairbanks station, 1929–30*

Date of recording	Depth of snow	Maximum temperature of—		Minimum temperature of—	
		Air	Soil at depth of 1 inch	Air	Soil at depth of 1 inch
1929	*Inches*	°*F.*	°*F.*	°*F.*	°*F.*
Oct. 8	0.0	34	33.0	29	32.0
Oct. 15	4.0	23	25.0	15	24.0
Oct. 22	5.0	45	26.5	21	22.0
Oct. 29	7.0	21	26.0	15	25.0
Nov. 5	9.0	21	23.0	7	22.0
Nov. 12	9.0	32	22.0	15	20.0
Nov. 19	10.0	12	15.0	−2	12.0
Nov. 26	13.0	23	25.0	9	24.0
Dec. 3	11.0	22	25.0	12	25.0
Dec. 10	14.0	13	23.5	2	23.0
Dec. 17	11.0	2	22.0	−13	21.0
Dec. 24	11.0	−22	17.0	−37	14.0
Dec. 31	11.0	−23	9.0	−47	7.0
1930					
Jan. 7	14.0	47	17.5	7	16.0
Jan. 14	11.5	11	20.0	−4	19.0
Jan. 21	11.0	9	19.5	−7	18.5
Jan. 28	13.0	12	19.5	−13	18.0
Feb. 4	14.5	−15	11.0	−26	10.0
Feb. 11	17.0	−23	11.5	−42	10.0
Feb. 18	17.0	−5	14.0	−24	13.0
Feb. 25	17.0	10	16.0	−18	15.0
Mar. 4	14.0	22	21.0	−3	19.5
Mar. 11	15.5	13	19.0	−32	17.5
Mar. 18	22.0	−3	18.0	−34	17.0
Mar. 25	17.0	33	21.0	−0	19.0
Apr. 1	12.0	30	29.0	7	27.5
Apr. 8	11.0	32	25.0	4	23.5
Apr. 15	7.0	42	31.5	11	29.0

The results are shown graphically in Figure 12. Temperature charts for October 14 to October 21, December 23 to December 30, December 30 to January 6, and April 21 to April 28, show a line running along without much fluctuation during the periods of very cold weather, December 23 to January 6, as compared with the series of rises and falls representing the warmer periods, when less snow was on the ground, as from October 14 to October 21 and from April 21 to April 28.

BERRIES

Raspberries.—The season was very favorable for raspberries, and yields were high. Cuthbert produced an abundance of fruit of fine quality. The beneficial effect of covering the plants with a heavy straw mulch during the winter was demonstrated by leaving some of the adjacent rows uncovered. The uncovered canes were severely injured, whereas the mulched canes came through the winter in strong condition and were far ahead of the uncovered canes in earliness and yield of fruit.

Strawberries.—The yield of strawberries was somewhat reduced by the dry weather of July, but on the whole was satisfactory, and the fruit was of high quality.

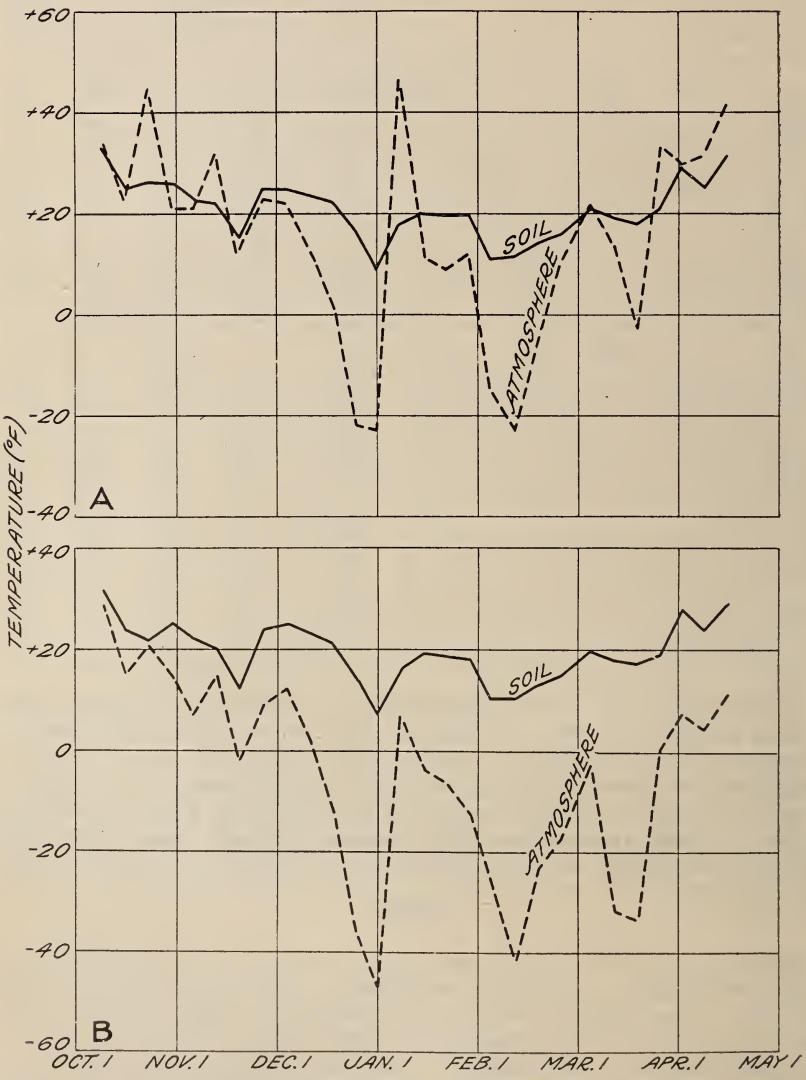

FIGURE 12.—Maximum (A) and minimum (B) temperatures of atmosphere and of soil at a depth of 1 inch.

CATTLE

During the winter of 1929–30 the Galloway-yak hybrids (fig. 13) were kept in a wooded pasture with only an open shed for shelter. They were fed oat straw supplemented beginning April 1 with oat hay, and were watered only during periods of extreme cold. At other times they obtained sufficient water from melting snow. Each animal consumed a total of approximately 2 tons of oat straw and 500 pounds of oat hay during the winter. In August, 1930, both yak and Galloway-yak hybrids were placed on the range at Lignite. The four Galloway cows were returned to the Kodiak station.

In January, 1930, a yak cow was slaughtered for meat. The animal had been fattened on peas and oat hay and was in excellent condition. The body weight was 680 pounds, and the dressed weight, 365 pounds,

FIGURE 13.—Yak cow and calf, Fairbanks station

or a dressing percentage of 53.7. The meat was much like beef in appearance and taste. All the cuts were tender and were said by those eating them to equal beef of the finest quality.

KODIAK STATION (KALSIN BAY)

WEATHER CONDITIONS

The weather on the island during the winter was normal and favorable for livestock on the open range. The spring was not so favorable. Table 16 gives weather records at the Kodiak station for February March, and April, 1920–1930.

TABLE 16.—*Temperature and precipitation for February, March, and April at the Kodiak station, yearly and average, 1920–1929, and 1930*

Year	Temperature									Precipitation		
	Minimum			Mean minimum			Monthly mean					
	February	March	April	February	March	April	February	March	April	February	March	April
	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	*Inches*	*Inches*	*Inches*
1920	12.0	8.0	13.0	29.0	25.8	26.2	34.2	31.4	31.7	2.80	0.91	1.30
1921	2.0	22.0	18.0	20.9	30.2	30.0	27.0	36.1	35.4	4.19	0.54	4.47
1922	7.0	2.0	24.0	26.2	24.8	32.1	31.6	30.6	36.4	2.79	1.40	6.07
1923	8.0	10.0	21.0	29.1	29.5	32.8	34.3	34.6	37.6	5.08	2.09	4.06
1924	15.0	28.0	9.0	26.1	32.9	28.1	30.0	37.7	34.4	7.61	3.85	3.88
1925	3.0	10.0	26.0	22.2	27.7	30.8	27.4	33.6	35.4	2.06	3.00	1.50
1926	11.0	27.0	30.0	27.8	34.4	36.2	32.4	38.2	41.1	4.12	8.81	5.30
1927	9.0	3.0	12.0	29.3	22.1	27.8	33.7	28.2	33.8	8.81	3.52	2.96
1928	19.0	9.0	22.0	30.2	22.6	31.3	34.2	27.8	36.4	5.40	2.37	3.25
1929	13.0	4.0	19.0	31.0	22.3	29.5	36.0	29.6	36.1	7.50	4.90	9.99
Average, 1920–1929	9.9	12.3	19.4	27.18	27.23	30.4	32.08	32.78	35.8	5.03	3.10	4.27
1930	1.0	1.0	12.0	12.9	23.2	28.3	20.3	28.4	33.7	4.00	6.30	4.35

Minimum temperatures for February, March, and April were lower than for the average for these months during the 10 preceding years, being 8.9° colder in February, 11.3° colder in March, and 7.4° colder in April. The mean minimum was 14.3° colder in February, 4.0° colder in March, and 2.1° colder in April than the average for the same months for the 10 preceding years. The precipitation was one-fifth below the average for February, twice the average for the 10 preceding years for March, and about equal to the average of the 10 preceding years for April. Snow covered the ground on 24 days in February, but only on 6 days was it more than 4.5 inches deep. One inch of snow fell February 1 and 3 inches February 28. Snow covered the ground for 18 days in March, but it was as deep as 4 inches on only 4 days. There was no snow in April. February, March, and April are the least favorable months for livestock raising on the island, yet the station cattle had to be fed hay on only 65 days in 1929–30.

HAYMAKING

Three stacks of brown hay were made from beach sedge (*Carex cryptocarpa*). It is a lush-growing plant and is very difficult to cure under Kodiak weather conditions. It makes an excellent silage and is greatly relished as a pasture by all kinds of livestock. The hay was cut, allowed to wilt, and built into stacks 10 feet in diameter and 15 feet high. The brown hay will be fed this winter to determine its nutritive value and palatability.

About 20 tons of native hay was harvested and stored in the barns. Approximately 25 tons of the hay made last year was transferred from stacks to the barn to prevent waste and spoilage by weather.

CATTLE

Six purebred Galloway cows, two heifers, a bull, and a 3-year-old steer were wintered on the range of the Kalsin Bay reservation. Five heifer calves and one bull calf were dropped during the year. One heifer calf died at birth. Hay made largely from bluetop (*Calamagrostis* sp.) and also from other native grasses was offered to the

cattle during 65 days of the late winter and early spring, but on only 46 days did they take more than a few mouthfuls of the material. They seemed to graze their fill from the meadows and the hay flats within a mile of the buildings.

HORSES

The work horses at Kalsin Bay wintered in the open without shelter except during a few days when the team was used for hauling wood and supplies. A 5-year-old saddle mare was purchased July 1 and sent to Kodiak to be used in herding cattle.

STATION IMPROVEMENTS

Two miles of old fence was repaired. One mile of new fence was built of split cedar posts that had been salvaged from driftwood.

Approximately 30 days were spent in clearing logs and flotsam from the tidal beaches preparatory to making hay from the beach grasses. Observations during the past 15 years have shown that the best growth of beach grasses is made on the flat lands that are usually under water during the extreme high tides in the fall. Grasses of lesser feeding value grow on the treeless uplands. The cause of the absence of trees in this region is not definitely known (*14, p. 19*).

The cottage occupied by the foreman was repaired during the winter. Flooring was renewed and the walls and ceiling of the kitchen lined with plaster board.

FAIRS

The station again made small but representative exhibits at the fairs held at Fairbanks, Anchorage, and Juneau. When the fairs were first organized the exhibits from the stations constituted one of the main features. These exhibits were not entered for prizes. Within recent years the farmers have increased the number of their exhibits, and those sent by the station now are only a small proportion of the total.

POISONING OF LIVESTOCK BY PLANTS

Poisonous plants, including the wild parsnip (*Cicuta douglasi*) (*4, p. 95*), along the coast, and the larkspur (*Delphinium* sp.) in the interior, were again reported to have caused the death of livestock in 1930. The heaviest losses along the coast have been reported from Gustavus, where, as the result of eating wild parsnip, 3 cattle died in 1920, 1 in 1923, 3 in 1926, 2 in 1927, and 13 in 1929. Seventeen of these cattle died in March and April, and five in August. It will be noted that the greatest number of deaths occurred in the spring. The ground is then soft, and the roots are easily pulled up. After the roots have become firmly established, the cattle are not likely to get them. The tender tops do not seem to be harmful and great quantities of them are eaten in the early spring when grass is scarce. Lands along the watercourses offer the greatest danger from poisoning because the plants growing there can be easily pulled up. In places remote from creeks and rivers there is less likelihood of poisoning. Piper (*16, p. 15*) in 1905 reported the growth of poisonous parsnips in this region. In March, 1929, the wild parsnip caused the death of two dairy cattle at Point Agassiz, near Petersburg. Livestock poisoning has also been reported from the interior. Cattle

losses there are believed to have been caused by the larkspur. In the vicinity of Palmer poisonous plants caused the death of a bull in 1929 and a cow in 1930. Seven cows are reported to have died within the last five years as the result of feeding on poisonous plants in the neighborhood of Moose Creek and Eska. The writer (*1, p. 16*) in 1928 reported the death of a Galloway bull and a Galloway cow on pasture at the Fairbanks station.

MOSQUITOES

Mosquitoes were comparatively numerous in the interior during the year, but were less troublesome than formerly. They appeared in large numbers about June 1 and disappeared about August 10. They annoy horses, cattle, and sheep, but hogs apparently are better able to withstand their attack. Smudges made by smouldering partly decayed wood are sometimes started in pastures to keep off mosquitoes. Animals on pasture will stay near the smudge if the mosquito infestation is severe. Howard and Bishopp (*9, p. 3,*) recommend the use of buhach, a pyrethrum powder, as a fumigant for mosquito control in dwellings. Mosquitoes are more numerous in some years than in others. During the summers of 1909, 1912, 1913, 1914, and 1915 the mosquitoes were comparatively few, whereas in the summers of 1917 and 1929 they were present in unusually large numbers.

APICULTURE

Two colonies of honeybees were taken from their winter quarters in the basement of a building at the Matanuska station and placed out of doors May 10. Both colonies were in a weakened condition. On May 23 they were placed in an outyard about 4 miles southwest of the station where white clover and other nectar-producing plants grow in greater abundance than at the station. A homesteader who formerly kept bees is taking care of them. Two 3-pound packages of bees were also received for trial from a beekeeper in California. On July 25 a swarm emerged from one of the new colonies.

The first attempts at beekeeping in Alaska, undertaken many years ago, were not successful. Some beekeeping within recent years has been done in the southern part of the Territory near the towns of Anchorage, Haines, and Wrangell.

A farmer living 3 miles south of Anchorage bought a colony of bees in the spring of 1924 but lost them the following winter. In the spring of 1925 he bought two more colonies, both of which swarmed during the summer. In the spring of 1926 he had four colonies, and in the spring of 1927, seven colonies. One of the latter died, and the others did not swarm. Of the six that went into winter quarters only two were alive in the spring of 1928. None survived the following winter.

In 1924–25 he wintered the colony out of doors. The entrance to the hive was closed accidentally, and the bees were found dead in the spring. In 1925–26 this farmer wintered some bees in an unheated log building. Dampness in the building caused the death of some of the colonies. In 1926–27 two colonies were wintered out of doors and the rest in a log building. Half of the colonies died at each place, leaving a total of seven active colonies in the spring of 1927. The hives that were wintered in the open were enveloped in

a layer of sawdust 4 inches deep and placed in a box. The entrances to the hives were 4 inches long and three-eighths of an inch high. Wintering in the open enabled the bees to make flights both late in the fall and early in the spring. The late flights were in October and the early flights in April.

When bees are to be overwintered in an unheated building in this climate they should be protected against dampness by placing a super or a half super filled with dry moss, immediately over the frames. Early in May bees begin to gather pollen from willows and other plants. In June many species of plants are in blossom, and sufficient pollen and nectar can then be gathered to build up strong colonies. The period of greatest honey flow extends from the first week of July to August 15. Nectar is then gathered from large areas of fireweed and from such other plants as the blueberry, the wild currant, the wild raspberry, and the alsike clover. Some nectar-producing plants are in blossom until October.

The weather during the early part of summer is favorable for bee culture in the Anchorage-Matanuska region. Although cloudy days are frequent, there is little rain during June and early July. A considerable quantity of nectar is available from about July 15 to August 15. The bees can gather this if the weather is favorable. Nectar-producing plants do not suffer from drought, because there is a plentiful supply of moisture in the ground from the melting snows of the previous winter and the rate of evaporation is comparatively slow, notwithstanding the warm days. During the period of greatest honey flow there are about 20 hours of light in the day, and a strong twilight throughout the night.

At Haines, about 500 miles southeast of Anchorage, in southeastern Alaska, a beekeeper has kept bees continuously since 1924. In the fall of 1927 he had four colonies, only one of which survived the following winter. The loss probably was caused by dampness. The bees were kept in an open shed and had plentiful stores. In the fall of 1929 this beekeeper had five colonies, three of which survived the following winter. Three new swarms emerged during the summer of 1930. Two colonies died during the summer. Yields of only 50 pounds of honey were obtained during the summer. This is about one-fourth of the amount usually obtained.

In the spring of 1929 a resident of Wrangell purchased a colony of bees primarily for cross-pollinating his fruit trees. He reported that this colony produced one new swarm and yielded 210 pounds of honey in 1929.

SURVEY OF THE SHEARWATER PORTAGE AND KILUDA BAY REGION

In July, W. T. White, associate animal husbandman of the Matanuska station, made a trip to the vicinity of the Shearwater and Kiluda Bays, Kodiak Island. Landing on the east side of the head of Shearwater Bay, Mr. White walked 14 miles across the portage in a northerly direction to the south side of Eagle Harbor (*2, p. 43*). The return trip was made along the foothills on the opposite side of the valley from the route taken to the portage.

The tidal and higher bench lands cut by small streams and creeks at the head of Shearwater are approximately 5 miles square in area.

The land rises somewhat from the northern limits of these benches for approximately 5 miles, then slopes gently to the north to Eagle Harbor. Approximately 50 square miles of desirable meadow and grazing lands lie between the east and the west hills in this portage. Cottonwood trees 5 to 16 inches in diameter cover 200 acres of the Shearwater bench lands. Somewhat smaller trees of this species cover about 100 acres along the Eagle Harbor beaches. The hillsides maintain good stands of grass well beyond the 1,000-foot contours. The region generally supports a good stand of grass, although on small areas of moss the grass makes sparse growth. This was found to be true particularly of the lower slopes of the hills on the western limits of the portage.

The area is ample for two or three medium-sized ranches or for one large ranch. The hills along the east side of Shearwater slope somewhat abruptly to the bay, but they are passable. A small, landlocked harbor nestles in the side of the hills, about 2 miles from the head of the bay, and affords the best-known protection on Kodiak Island for boats of 200-ton capacity (gross). Shearwater Bay is protected from the seas and will admit boats of all depths, but it is exposed to the strong winds that sweep in across the portage from Eagle Harbor. There is a large cannery dock on the west side of Shearwater Bay about 1 mile from the head of the bay. That the soil on the floor of the portage is fertile is indicated by the rank growth of vegetation there. The native soil is overlain by a layer of volcanic ash about 5 inches deep.

Shearwater Bay is an arm of Kiluda Bay. Kiluda Bay proper heads northerly in two arms. Mr. White traveled along the hills on the west side of Shearwater for a distance of 4 miles to the north arm of Kiluda. The usable land there for grazing is estimated at about 10 square miles. Much of the area, however, is rather steep, with considerable brush on the hillsides. Approximately 1 square mile of meadow land is available in the area, but a thin stand of cottonwood covers a portion of it.

Continuing in a southerly direction along the beach to the south arm, around the head of the north arm, Mr. White found an area of approximately 30 square miles of desirable grazing land adjacent to this arm of the bay. Much of the land is rather rough and broken, being cut by numerous gullies and small canyons, but it is promising for grazing. The tidal flats are rather extensive thereabouts, however, and the land at the head of the bay supports a good stand of cottonwood trees interspersed with numerous grassy parks on which are excellent stands of grass suitable for making hay. There are two sheltered anchorages for boats of 200-ton capacity on the south side of the bay. The area is desirable for two or more cattle ranches.

Adjoining this area on the west and accessible by a low pass from the Kiluda grasslands, there is an area in the vicinity of Old Harbor of approximately 60 square miles of very good range. The area is approachable by boat through Sitkalidak Straits to a landlocked harbor.

WEATHER REPORTS

CONDENSED METEOROLOGICAL REPORTS FOR 1930

ANCHORAGE. Latitude 61° 13′, longitude 149° 52′. A. M. Cook, observer

Month	Temperature					Total precipitation	Number of days—			
	Maximum	Minimum	Mean maximum	Mean minimum	Monthly mean		Rain or snow	Clear	Partly cloudy	Cloudy
	° F.	° F.	° F.	° F.	° F.	Inches				
January	43	−14	21.3	6.6	14.0	0.47	1	13	10	7
February	42	−20	16.1	−1.1	7.5	.34	4	11	5	12
March	49	−10	32.1	14.2	23.2	1.61	4	9	9	13
April	59	12	44.1	25.7	34.9	.36	3	12	9	9
May	68	27	54.7	35.4	45.0	.82	7	3	16	12
June	66	37	60.6	42.7	51.6	.37	4	4	15	11
July	70	39	63.4	49.5	56.4	2.38	14	4	9	18
August	77	43	67.2	49.9	58.6	3.68	20	1	11	19
September	72	23	59.9	37.4	48.6	1.96	12	5	16	9
October	53	11	45.3	25.0	35.2	.26	7	10	10	11
November	45	−6	33.4	13.9	23.6	.44	5	6	17	7
December	44	0	36.1	17.5	26.8	.18	6	3	15	13

ANNEX CREEK. Latitude 58° 19′, longitude 134° 07′. R. C. Haydon, observer

January	38	−6	22.9	10.2	16.6	1.67	5	24	0	7
February	43	−10	29.5	19.8	24.6	14.49	20	3	3	22
March	48	−1	37.2	26.1	31.6	12 00	18	4	4	23
April	57	20	47.2	32 0	39.6	3.03	18	8	9	13
May	74	30	55.0	37.9	46.4	3.50	12	8	11	12
June	76	37	62.3	43.3	52.8	4.35	12	13	6	11
July	76	42	61.6	46.1	53.8	6.68	14	11	3	17
August	78	40	60.3	45.3	52.8	11.82	21	12	4	15
September	65	32	53.6	41.3	47.4	15.66	23	7	8	14
October	56	20	43.7	32 8	38.2	16.13	20	11	4	16
November	49	15	39.2	28 0	33.6	22.38	28	4	5	21
December	51	23	39.4	30.3	34.8	17.11	29	2	3	26

BETHEL. Latitude 60° 45′, longitude 161° 47′. Weather Bureau, observer

January	45	−16	32.4	20.3	26.4	0.76	13	7	5	19
February	36	−30	2.7	−13.9	−5.6	.25	7	16	6	6
March	38	−33	19.0	−3.2	7.9	1.01	14	9	7	15
April	54	−18	32.5	14.4	23.4	.46	10	10	8	12
May	59	16	46.0	30.2	38.1	.54	10	0	3	28
June	71	31	60.1	40.2	50.2	1.47	14	7	9	14
July	68	36	57.1	44.9	51.0	2.63	22	1	8	22
August	79	34	59.5	46.1	52.8	3.41	22	3	10	18
September	62	25	49.0	35.3	42.2	2.79	22	2	7	21
October	47	4	36.7	26.1	31.4	2.06	15	3	3	25
November	35	−11	13.7	1.8	7.8	.57	6	10	5	15
December	35	−21	20.8	2.9	11.8	.88	15	4	9	18

CALDER. Latitude 56° 10′, longitude 133° 27′. Harvey Sellers, observer

January	38	8	29.9	18.0	24.0	2.26	7	21	1	9
February	43	12	35.9	28.8	32.4	17.96	24	2	2	24
March	50	10	40.8	27.5	34.2	6.61	19	10	3	18
April	65	26	50.0	33.5	41.8	6.31	18	11	5	14
May	74	28	55.1	36.4	45.8	4.53	17	8	8	15
June	82	35	59.4	42.3	50.8	7.51	13	17	2	11
July	70	39	61.7	46.2	54.0	4.37	13	7	6	18
August	83	43	65.4	50.4	57.9	3.56	14	10	2	19
September	75	28	60.4	44.0	52.2	8.74	18	11	3	16
October	59	25	49.4	35.7	42.6	22.09	21	8	2	21
November	58	25	45.1	35.6	40.4	20.16	24	6	1	23
December	53	30	45.7	36.1	40.9	24.70	29	0	2	29

Condensed meteorological reports for 1930—Continued

CHIGNIK. Latitude 56° 17′, longitude 158° 22′. Ivar Wallin, observer

Month	Temperature					Total precipitation	Number of days—			
	Maximum	Minimum	Mean maximum	Mean minimum	Monthly mean		Rain or snow	Clear	Partly cloudy	Cloudy
	° F.	° F.	° F.	° F.	° F.	Inches				
January	46	10	38.0	29.2	33.6	29.86	21	7	7	17
February	38	−5	19.6	6.7	13.2	5.03	6	11	8	9
March	46	−2	32.9	19.1	26.0	6.71	13	10	7	14
April	51	5	38.7	25.1	31.9	2.85	3	15	5	10
May	50	25	41.8	31.3	36.6	35.71	18	5	8	18
June	61	30	53.0	37.5	45.2	4.84	7	10	9	11
July	65	33	57.1	42.6	49.8	2.34	9	10	7	14
August	71	36	59.2	45.1	52.2	.95	6	7	14	10
September	75	27	52.8	38.4	45.6	9.35	13	2	11	17
October	55	22	44.0	32.4	38.2	20.13	12	4	14	13
November	50	4	35.3	23.0	29.2	13.86	13	5	6	19
December	40	5	33.7	24.1	28.9	7.58	17	7	10	14

DILLINGHAM. Latitude 59° 00′, longitude 158° 28′. J. B. Fleckenstein, observer

January	38	−8	31.6	23.0	27.3	0.61	6	13	10	8
February	36	−18	12.4	−2.0	5.2	.71	8	20	4	4
March	37	−22	25.9	9.1	17.5	4.35	17	16	3	12
April	51	0	36.4	22.2	29.3	2.95	11	17	4	9
May	56	10	48.5	21.3	34.9	1.73	15	6	11	14
June	76		60.6			1.09	16	9	13	8
July	79	27	65.4	43.4	54.4	4.40	20	12	11	8
August	78	37	64.4	47.6	56.0	3.38	21	19	7	5
September	70	22	56.3	37.3	46.8	1.82	15	15	6	9
October	60	18	46.8	30.2	38.5	4.88	12	10	5	16
November	50	−5	28.7	10.8	19.8	2.31	13	12	2	16
December		−11		15.9		3.70	19	2	5	24

DUTCH HARBOR. Latitude 53° 55′, longitude 166° 30′. Weather Bureau, observer

January	46	22	40.7	33.6	37.2	14.00	25	1	5	25
February	48	11	29.3	20.5	24.9	1.57	15	0	3	25
March	50	14	35.5	26.2	30.8	4.22	19	3	3	25
April	52	13	41.1	30.3	35.7	1.54	11	2	5	23
May	57	28	46.1	34.5	40.3	4.08	19	1	11	19
June	55	36	49.7	39.5	44.6	3.82	16	0	5	25
July	69	36	58.7	44.6	51.6	1.60	13	3	12	16
August	76	40	61.1	47.5	54.3	.99	10	3	9	19
September	59	35	52.6	42.2	47.4	4.58	15	1	7	22
October	55	31	48.4	38.5	43.4	7.20	18	4	5	22
November	54	24	40.2	30.8	35.5	4.98	18	1	9	20
December	42	20	35.8	27.7	31.8	4.71	21	6	16	9

EAGLE. Latitude 64° 46′, longitude 141° 12′. Weather Bureau, observer

January	14	−49	−5.8	−19.6	−12.7	0.18	4	21	5	5
February	32	−65	−12.2	−32.5	−22.4	.39	7	11	1	16
March	52	−49	18.3	−2.4	8.0	.51	7	9	3	19
April	52	−12	38.4	14.7	26.6	.29	5	7	5	18
May	77	22	60.3	32.6	46.4	1.00	13	11	3	17
June	84	34	70.9	44.0	57.4	1.11	13	5	9	16
July	83	36	74.5	48.0	61.2	1.17	13	5	2	24
August	84	29	69.3	42.5	55.9	4.01	16	1	4	26
September	70	17	52.0	34.0	43.0	2.10	15	2	2	26
October	49	−6	30.9	16.1	23.5	.75	12	8	4	19
November	39	−52	10.8	−8.9	1.0	1.38	15	7	4	19
December	35	−24	15.0	−1.9	6.6	.28	10	6	10	15

Condensed meteorological reports for 1930—Continued

FAIRBANKS. Latitude 64° 52′, longitude 147° −39′. Weather Bureau, observer

Month	Temperature					Total precipitation	Number of days			
	Maximum	Minimum	Mean maximum	Mean minimum	Monthly mean		Rain or snow	Clear	Partly cloudy	Cloudy
	° F.	° F.	° F.	° F.	° F.	Inches				
January	40	−38	4.6	−15.0	−5.2	0.31	6	19	2	10
February	32	−51	−11.4	−30.8	−21.1	.36	4	14	7	7
March	47	−44	19.0	−5.7	6.6	.73	15	4	8	19
April	56	−18	36.8	14.1	25.4	.15	5	9	7	14
May	79	26	61.1	37.1	49.1	.68	8	5	13	13
June	85	39	68.5	46.1	57.3	2.09	14	4	15	11
July	79	38	70.7	48.6	59.6	2.62	12	4	16	11
August	78	34	62.8	45.2	54.0	6.88	20	0	8	23
September	68	22	49.8	34.6	42.2	1.29	14	5	5	20
October	44	4	32.5	19.4	26.0	.94	10	7	6	18
November	35	−37	5.7	−11.6	−3.0	.69	11	7	4	19
December	31	−21	8.5	−8.3	.1	.21	4	5	7	19

FAIRBANKS (near). Latitude 64° 51′, longitude 147° 52′. United States Experiment Station, observer

January	40	−30	9.6	−8.0	0.8	0.26	7	21	3	7
February	39	−45	−6.7	−25.2	−16.0	.41	3	17	5	6
March	49	−34	21.1	−1.1	10.0	.96	10	11	6	14
April	59	−12	39.3	16.3	27.8	.15	4	11	14	5
May	81	23	63.5	35.0	49.2	.54	6	7	15	9
June	86	36	72.1	43.9	58.0	2.42	13	6	16	8
July	82	35	73.8	46.7	60.2	.75	8	4	19	8
August	80	30	65.2	44.7	55.0	8.19	20	1	13	17
September	68	18	52.2	33.6	42.9	1.41	19	4	10	16
October	44	1	33.6	18.3	26.0	.95	10	11	4	16
November	31	−34	8.2	−8.9	−0.4	.59	11	10	4	16
December	33	−17	13.1	−4.6	4.2	.24	5	9	9	13

FORT YUKON. Latitude 66° 34′, longitude 145° 18′. Weather Bureau, observer

January	35	−50	−7.7	−24.3	−16.0	0.10	2	25	0	6
February	7	−62	−19.3	−38.2	−28.8	.06	2	21	1	6
March	35	−46	8.8	−12.7	−2.0	.20	7	9	4	18
April	46	−30	29.6	3.1	16.4	.32	3	17	4	9
May	80	20	60.5	37.5	49.0	.08	2	19	6	6
June	82	38	72.2	50.0	61.1	.84	6	19	3	8
July	84	43	72.7	52.8	62.8	.42	7	17	6	8
August	78	28	63.5	46.5	55.0	2.96	17	10	8	13
September	62	22	50.2	33.7	42.0	.46	9	12	4	14
October	38	−8	26.7	13.8	20.2	.71	5	10	3	18
November	20	−46	−1.0	−17.3	−9.2	.54	5	11	3	16
December	19	−34	−1.5	−16.5	−9.0	.14	4	11	2	18

HAINES. Latitude 59° 13′, longitude 135° 34′. E. E. Bromley, observer

January	42	−6	26.5	7.7	17.1	1.64	5	24	1	6
February	43	−13	28.6	15.4	22.0	9.14	19	3	3	22
March	49	−6	35.4	21.2	28.3	6.33	20	8	2	21
April	59	18	47.7	30.3	39.0	1.96	10	11	5	14
May	75	29	57.6	39.1	48.4	1.23	9	8	4	19
June	84	33	64.2	44.1	54.2	1.89	10	13	5	12
July	78	41	64.5	48.7	56.6	3.68	14	[1] 6	[1] 3	[1] 21
August	78	35	64.2	48.0	56.1	3.53	15	9	2	20
September	70	30	57.3	41.8	49.6	6.80	19	6	1	23
October	56	16	45.2	30.4	37.8	10.95	14	[1] 10	[1] 2	[1] 18
November	47	9	36.8	25.4	31.1	12.56	24	1	2	27
December	46	20	39.3	30.7	35.0	16.68	25	2	0	29

[1] Record incomplete.

Condensed meteorological reports for 1930—Continued

HOLY CROSS. Latitude 62° 16′, longitude 159° 50′. Sisters of St. Ann, observers

Month	Temperature					Total precipitation	Number of days—			
	Maximum	Minimum	Mean maximum	Mean minimum	Monthly mean		Rain or snow	Clear	Partly cloudy	Cloudy
	° F.	° F.	° F.	° F.	° F.	*Inches*				
January	42	−23	27.6	13.4	20.5	1.05	4	13	8	10
February	39	−28	1.6	−13.8	−6.1	.58	5	19	4	5
March	41	−28	18.0	3.4	10.7	1.28	8	15	4	12
April	47	−20	34.6	15.6	25.1	.47	5	14	6	10
May	64	17	49.0	32.6	40.8	.79	6	8	8	15
June	73	37	63.2	43.6	53.4	.56	3	15	8	7
July	68	32	60.0	44.5	52.2	3.50	16	5	7	19
August	74	32	59.9	45.3	52.6	4.02	17	4	4	23
September	58	15	47.9	34.7	41.3	2.42	11	10	5	15
October	45	1	34.9	23.6	29.2	1.60	6	8	5	17
November	36	−22	10.9	−2.8	4.0	.80	5	15	2	13
December										

JUNEAU. Latitude 58° 18′, longitude 134° 24′. Weather Bureau, observer

January	42	7	28.6	18.3	23.4	0.91	5	20	3	8
February	45	2	33.4	24.9	29.2	8.59	23	2	2	24
March	48	2	36.6	27.4	32.0	10.12	24	1	7	23
April	60	27	46.5	33.2	39.8	4.05	20	6	5	19
May	72	32	53.8	39.1	46.4	3.87	17	2	9	20
June	82	38	60.5	44.8	52.6	3.78	17	7	6	17
July	77	46	60.1	49.4	54.8	6.29	20	6	1	24
August	75	44	61.5	49.7	55.6	9.46	22	5	6	20
September	68	34	55.4	45.1	50.2	9.75	26	5	2	23
October	56	22	45.0	35.6	40.3	14.51	21	7	3	21
November	52	20	41.5	32.5	37.0	13.20	27	1	4	25
December	50	30	42.3	35.7	39.0	12.86	29	0	1	30

KAKE. Latitude 56° 59′, longitude 133° 57′. E. L. Keithahn, observer

January	39	11	32.4	19.7	26.0	2.10	4	23	2	6
February	43	8	37.1	28.2	32.6	9.18	22	3	3	22
March	48	5	40.0	27.8	33.9	2.67	13	12	5	14
April	58	26	47.4	33.4	40.4	3.07	16	7	10	13
May	60	28	51.5	37.7	44.6	1.34	9	13	2	16
June	88	37	63.1	43.3	53.2	3.42	9	15	4	11
July	67	42	60.8	48.5	54.6	2.57	9	7	9	15
August	70	41	62.0	49.6	55.8	3.40	13	9	8	14
September	66	31	57.0	44.2	50.6	6.66	18	8	10	12
October	55	20	46.8	34.9	40.8	13.65	18	9	4	18
November	52	24	44.0	34.4	39.2	11.10	22	4	7	19
December	51	29	43.9	36.4	40.2	13.44	25	1	5	25

KALSIN BAY. Latitude 57° 34′, longitude 152° 27′. United States Experiment Station, observer

January	47	13	39.2	28.8	34.0	8.12	14	9	7	15
February	38	1	28.0	12.9	20.4	4.07	9	8	4	16
March	42	1	34.8	23.2	29.0	6.30	18	6	3	22
April	48	12	39.4	28.3	33.8	4.35	18	3	6	21
May	51	25	43.7	34.5	39.1	10.19	23	2	1	28
June	62	34	52.3	39.9	46.1	8.44	18			
July	65	37	55.2	45.8	50.5	6.63	16			
August	80	38	58.6	45.2	51.9	3.05	13	5	10	16
September	60	27	54.5	38.5	46.5	6.65	17	8	6	16
October	61	23	47.4	31.8	39.6	5.26	16	9	5	17
November	47	9	39.8	25.0	32.4	8.37	22	5	5	20
December	47	10	38.3	26.7	32.5	9.72	19	4	2	25

Condensed meteorological reports for 1930—Continued

KASILOF. Latitude 60° 21′, longitude 151° 18′. Perry A. Cole, observer

Month	Temperature					Total precipitation	Number of days—			
	Maximum	Minimum	Mean maximum	Mean minimum	Monthly mean		Rain or snow	Clear	Partly cloudy	Cloudy
	° F.	° F.	° F.	° F.	° F.	Inches				
January	45	−10	25.0	10.1	17.6	0.50	2	27	4	0
February	45	−21	19.0	−.3	9.4	.10	1	23	2	3
March	49	−24	32.5	10.6	21.6	.35	3	17	4	10
April	55	5	43.4	22.6	33.0	1.00	2	23	1	6
May	77	21	53.6	31.7	42.6	1.69	8	15	6	10
June	70	28	59.0	37.6	48.3	2.90	4	[1] 14	[1] 6	[1] 9
July	71	35	64.3	44.8	54.6	3.16	6	[1] 13	[1] 2	[1] 14
August	75	39	65.5	46.8	56.2	.48	16	12	7	12
September										
October	58	8	45.7	24.3	35.0	.35	6	16	6	9
November		−11		12.2		1.30	12	20	9	1
December		−7		13.6		.61	4	19	7	5

KENNECOTT. Latitude 61° 29′, longitude 142° 57′. Kennecott Copper Corporation, observer

January	29	−34	3.7	−12.7	−4.5	0.58	3	24	1	6
February	34	−32	7.5	−10.3	−1.4	1.36	7	6	4	18
March	44	−20	26.3	8.5	17.4	2.68	10	6	5	20
April	56	9	40.4	18.9	29.6	1.25	3	18	0	12
May	70	24	57.5	32.0	44.8	.25	2	5	10	16
June	73	31	64.4	37.5	51.0	.45	2	18	6	6
July	73	39	65.9	40.8	53.4	1.54	6	15	5	11
August	68	37	61.6	40.5	51.0	1.79	10	6	8	17
September	66	25	49.5	33.6	41.6	2.48	15	7	3	20
October	45	−4	32.1	15.7	23.9	1.53	6	9	2	20
November	40	−18	24.4	9.4	16.9	2.27	16	3	2	25
December	40	−2	29.5	13.6	21.6	1.35	7	0	7	24

KETCHIKAN. Latitude 55° 20′, longitude 131° 37′. Weather Bureau, observer,

January	48	12	36.0	21.8	28.9	1.82	7	19	4	8
February	50	21	41.7	32.6	37.2	14.96	23	1	5	22
March	53	17	43.7	31.7	37.7	9.49	18	7	1	23
April	62	28	50.9	36.9	43.9	9.00	18	3	6	21
May	73	32	55.3	39.6	47.4	6.02	16	4	8	19
June	79	37	61.2	46.7	54.0	10.72	12	4	9	17
July	81	43	64.8	49.6	57.2	6.55	17	10	3	18
August	78	46	68.5	53.7	61.1	1.63	10	11	5	15
September	74	35	62.3	49.4	55.8	13.37	17	10	2	18
October	58	28	50.4	40.0	45.2	24.14	20	7	2	22
November	55	26	46.7	38.4	42.6	23.90	26	2	5	23
December	54	34	47.1	40.4	43.8	35.16	30	0	2	29

KODIAK. Latitude 57° 46′, longitude 152° 22′. Weather Bureau, observer

January	47	18	41.5	29.9	35.7	3.11	14	8	8	15
February	41	2	28.4	16.6	22.5	2.40	11	7	9	12
March	48	9	37.9	24.8	31.4	3.24	17	6	10	15
April	56	13	44.7	30.1	37.4	2.54	15	8	6	16
May	58	26	47.4	36.3	41.8	5.47	22	4	7	20
June	68	36	54.5	41.8	48.2	4.52	16	8	6	16
July	66	40	59.6	47.1	53.4	2.77	16	5	8	18
August	81	41	63.7	48.9	56.3	1.33	12	7	8	16
September	64	30	55.4	42.8	49.1	3.97	16	2	14	14
October	58	24	47.5	34.5	41.0	2.96	12	14	6	11
November	46	18	40.4	29.5	35.0	8.24	22	11	5	14
December	44	20	39.7	29.3	34.5	6.44	22	7	11	13

[1] Record incomplete.

Condensed meteorological reports for 1930—Continued

LATOUCHE. Latitude 60° 3′, longitude 147° 55′. Kennecott Copper Corporation, observer

Month	Temperature					Total precipitation	Number of days—			
	Maximum	Minimum	Mean maximum	Mean minimum	Monthly mean		Rain or snow	Clear	Partly cloudy	Cloudy
	° F.	° F.	° F.	° F.	° F.	*Inches*				
January	42	9	37.1	26.1	31.6	4.40	13	2	24	5
February	38	10	32.5	21.0	26.8	10.13	19	6	11	11
March	45	10	36.5	25.4	31.0	16.82	20	5	14	12
April	55	19	44.8	29.3	37.0	8.32	12	11	11	8
May	64	31	47.9	35.8	41.8	11.93	20	8	2	21
June	66	35	56.9	42.1	49.5	2.72	13	9	6	15
July	73	41	59.8	48.9	54.4	8.19	16	7	7	17
August	76	46	61.1	51.9	56.5	10.10	23	3	4	24
September	63	32	56.5	42.2	49.4	14.80	21	8	10	12
October	53	28	47.2	34.2	40.7	14.03	18	9	10	12
November	47	15	39.7	29.5	34.6	27.88	23	7	2	21
December	48	25	40.2	31.2	35.7	31.32	30	3	3	25

McKINLEY PARK. Latitude 63° 44′, longitude 148° 55′. National Park Service, observer

January	37	−25	21.6	3.8	12.7	0.28	2	17	0	14
February	40	−40	−.7	−20.9	−10.8	.20	1	23	0	5
March	40	−29	18.3	.1	9.2	.55	3	17	0	14
April	46	−10	33.7	10.5	22.1	.48	1	24	0	6
May	67	22	51.1	31.8	41.4	0.00	0	28	0	3
June	76	33	62.7	38.8	50.8	3.57	6	19	0	11
July	72	38	65.8	45.0	55.4	.84	2	26	0	5
August	69	30	59.7	42.9	51.3	6.84	12	11	0	20
September	60	11	47.0	30.0	38.5	2.00	8	14	0	16
October	47	−12	32.2	13.4	22.8	.40	2	18	0	13
November	45	−32	10.6	−8.2	1.2			17	7	6
December	40	−14	28.9	8.6	18.8			17	1	13

MATANUSKA. Latitude 61° 30′, longitude 149° 15′. United States Experiment Station, observer

January	42	−22	21.0	1.9	11.4	0.87	3	21	6	4
February	43	−25	16.1	−4.1	6.0	.46	7	12	8	8
March	54	−11	31.5	12.2	21.8	1.42	7	11	6	14
April	60	12	45.6	24.3	35.0	.57	5	15	6	9
May	76	22	58.2	32.4	45.3	1.12	4	[1] 8	[1] 10	[1] 10
June	80	33	64.4	42.3	53.4	2.72	10			
July	73	42	67.2	49.3	58.2	2.08	14	14	7	10
August	73	40	65.4	48.7	57.0	6.21	28			
September	66	23	54.2	35.5	44.8	5.42	17	14	5	11
October	57	8	40.9	24.0	32.4	1.49	9	16	4	11
November	47	−12	28.0	12.0	20.0	2.18	12	10	11	9
December	44	2	34.7	19.0	26.8	1.24	9	3	14	14

CORDOVA (Mile 7). Latitude 60° 31′, longitude 145° 36′. Weather Bureau, observer

January	41	−9	30.7	8.2	19.4	1.48	4	21	3	7
February	43	−14	32.7	11.9	22.3	6.91	19	7	4	17
March	48	−4	38.5	21.5	30.0	11.84	20	5	9	17
April	60	15	46.8	26.9	36.8	8.11	15	11	7	12
May	72	29	54.0	35.6	44.8	8.77	20	6	10	15
June	78	33	61.4	42.2	51.8	2.00	14	10	7	13
July	74	40	62.7	46.8	54.8	11.08	21	0	8	23
August	78	40	66.5	47.6	57.0	7.97	21	0	8	23
September	69	30	59.0	40.1	49.6	16.02	24	0	6	24
October	55	18	49.2	29.8	39.5	7.10	19	10	5	16
November	55	12	41.3	27.6	34.4	21.49	22	2	12	16
December	58	23	45.5	31.0	38.2	18.79	31	1	12	18

[1] Record incomplete.

Condensed meteorological reports for 1930—Continued

NAKNEK. Latitude 58° 41′, longitude 157° 0′. W. N. Reed, observer

Month	Temperature					Total precipitation	Number of days—			
	Maximum	Minimum	Mean maximum	Mean minimum	Monthly mean		Rain or snow	Clear	Partly cloudy	Cloudy
	° F.	° F.	° F.	° F.	° F.	Inches				
January	45	−16	33.9	20.2	27.0	0.70	2	11	2	18
February	39	−18	10.0	−7.6	1.2	.40	2	20	0	8
March	40	−22	28.3	9.8	19.0	1.56	7	14	2	15
April	57	5	39.8	23.5	31.6	1.44	6	6	3	21
May	62	22	47.4	32.4	39.9	.79	3	3	0	28
June	64	36	57.0	41.3	49.2	.64	1	13	7	10
July	68	39	58.6	45.3	52.0	3.83	8	7	1	23
August	70	42	60.5	49.3	54.9	5.15	12	8	3	20
September	59	26	50.1	38.5	44.3	4.31	10	4	5	21
October	50	12	42.7	27.9	35.3	1.32	5	10	2	20
November	38	−11	23.1	7.5	15.3	1.47	8	10	0	20
December	36	−13	28.2	14.2	21.2	3.75	8	5	1	25

NOME. Latitude 64° 30′, longitude 165° 24′. Weather Bureau, observer

January	35	−5	29.3	16.2	22.8	2.45	--------	6	6	19
February	31	−35	2.3	−15.4	−6.6	.71	--------	15	8	5
March	32	−31	10.5	−8.6	1.0	2.05	10	9	14	8
April	42	−19	25.7	10.3	18.0	.77	8	9	11	10
May	54	9	39.0	26.1	32.6	.46	10	4	9	18
June	62	28	50.2	37.2	43.7	1.84	15	7	5	18
July	60	30	51.8	42.5	47.2	4.90	17	3	3	25
August	59	31	52.1	41.7	46.9	5.76	22	[2] 1	[2] 6	[2] 24
September	58	18	45.7	31.1	38.4	1.98	12	5	12	13
October	42	2	35.5	25.5	30.5	2.44	15	6	3	22
November	25	−15	12.8	−0.8	6.0	.11	6	16	6	8
December	31	−16	16.4	3.6	10.0	.87	18	1	6	24

PETERSBURG. Latitude 56° 50′, longitude 132° 57′. Jacob Otness, observer

January	37	3	27.9	14.8	21.4	1.51	3	22	1	8
February	43	5	36.9	28.4	32.6	11.91	22	1	0	27
March	50	12	39.5	27.1	33.3	7.25	14	3	11	17
April	60	25	48.7	33.4	41.0	5.85	17	9	5	16
May	71	29	57.4	35.7	46.6	3.84	16	4	12	15
June	81	33	63.2	42.9	53.0	5.07	13	8	7	15
July	80	44	64.5	47.7	56.1	4.53	14	8	2	21
August	78	40	66.1	48.6	57.4	5.55	13	9	7	15
September	73	30	58.8	43.6	51.2	10.28	18	9	5	16
October	58	19	46.7	34.9	40.8	21.34	22	9	3	19
November	54	20	43.3	33.8	38.6	21.12	26	0	4	26
December	50	29	44.2	36.1	40.2	21.27	29	0	0	31

RAMPART. Latitude 65° 30′, longitude 150° 15′. Clement Anderson, observer

January	36	−45	−0.1	−19.1	−9.6	0.21	2	20	3	8
February	10	−55	−17.3	−29.4	−23.4	.08	1	21	6	1
March	30	−37	8.9	−11.1	−1.1	.93	7	14	4	13
April	50	−27	29.9	7.5	18.7	.12	1	18	5	7
May	80	21	54.9	32.6	43.8	.75	3	20	5	6
June	82	31	70.6	42.7	56.6	2.18	4	17	8	5
July	80	31	71.1	43.8	57.4	1.01	3	15	8	8
August	75	24	61.9	41.2	51.6	3.72	12	5	12	14
September	60	11	47.9	32.1	40.0	1.07	7	8	7	15
October	40	−1	26.9	15.8	21.4	.60	7	6	3	22
November	21	−38	−.1	−15.6	−7.8	.43	6	13	5	12
December	19	−39	3.3	−11.2	−4.0	.13	2	12	5	14

SEWARD. Latitude 60° 6′, longitude 149° 27′. Anton Eide, observer

January	45	−4	34.7	22.0	28.4	1.86	5	26	0	5
February	41	0	23.7	13.9	18.8	2.42	9	23	1	4
March	46	5	34.3	23.3	28.8	7.53	18	14	2	15
April	63	19	44.3	30.8	37.6	3.53	9	20	0	10
May	66	31	50.2	37.8	44.0	3.20	14	12	0	19
June	70	38	58.2	43.7	51.0	1.12	5	[1] 16	[1] 1	[1] 8
July	76	39	60.8	48.4	54.6	3.38	9	12	0	19
August	78	40	59.9	50.3	55.1	6.32	13	11	0	26
September	61	31	54.0	42.5	48.2	5.62	13	16	0	14
October	52	21	45.0	33.7	39.4	4.68	10	16	0	15
November	44	12	34.9	25.4	30.2	12.76	14	13	0	17
December	43	17	37.4	27.0	32.2	14.44	16	8	1	22

[1] Record incomplete.

[2] Unable to verify at this time.

Condensed meteorological reports for 1930—Continued

SITKA. Latitude 57° 3′, longitude 135° 19′. United States Experiment Station and F. H. Robinson, observers

Month	Temperature					Total precipitation	Number of days—			
	Maximum	Minimum	Mean maximum	Mean minimum	Monthly mean		Rain or snow	Clear	Partly cloudy	Cloudy
	° F.	° F.	° F.	° F.	° F.	*Inches*				
January	45	3	34.6	17.6	26.1	1.36	7	19	5	7
February	44	10	37.4	28.3	32.8	12.72	22	2	6	20
March	47	4	40.0	27.5	33.8	10.55	21	1	16	14
April	66	25	48.7	31.6	40.2	4.53	19	6	13	11
May	78	28	53.2	36.2	44.7	4.38	20	2	14	15
June	81	33	59.5	40.8	50.2	3.02	15	5	9	16
July	70	42	60.5	48.2	54.4	2.75	14	4	13	14
August	79	43	64.6	51.0	57.8	6.20	19	3	15	13
September	69	28	57.6	43.4	50.5	11.73	23	2	12	16
October	61	26	51.3	36.6	44.0	13.03	16	9	11	11
November	58	25	47.7	35.5	41.6	15.02	27	5	9	16
December	57	30	48.0	36.1	42.0	14.49	29	0	19	12
SKAGWAY. Latitude 59° 27′, longitude 135° 19′. Dr. Peter I. Dahl, observer										
January	37	0	22.3	13.2	17.8	0.21	2	19	7	5
February	42	−7	28.7	17.0	22.8	2.21	8	0	8	20
March	53	−4	37.8	24.4	30.6	.43	3	[1] 8	[1] 8	[1] 13
April	64	20	48.7	31.7	40.2	.16	3	[1] 15	[1] 9	[1] 5
May	78	30	58.5	37.8	48.2	.33	6	[1] 12	[1] 9	[1] 7
June	85	31	65.3	43.3	54.3	1.01	6	[1] 17	[1] 8	[1] 4
July	79	40	64.8	49.6	57.2	3.35	8	10	4	17
August	78	35	66.2	49.8	58.0	2.80	16	[1] 14	[1] 3	[1] 12
September	68	26	57.5	43.5	50.5	2.70	13	8	11	11
October	54	12	44.6	33.3	39.0	5.12	14	[1] 5	[1] 7	[1] 18
November	52	14	38.3	27.8	33.0	8.27	15	[1] 3	[1] 7	[1] 19
December	47	24	40.8	32.1	36.4	7.50	18	1	3	27
TANANA. Latitude 65° 10′, longitude 152° 6′. Weather Bureau, observer										
January	38	−40	7.1	−10.2	−1.6	1.15	8	20	6	5
February	21	−55	−14.1	−33.7	−23.9	.23	4	17	9	2
March	37	−46	11.6	−10.9	.4	1.83	15	7	13	11
April	50	−26	34.5	9.4	22.0	.17	4	10	13	7
May	78	22	58.8	35.0	46.9	.53	7	8	19	4
June	83	33	71.7	43.8	57.8	1.45	14	10	15	5
July	78	30	69.7	46.9	58.3	2.51	18	4	16	11
August	76	27	61.4	43.8	52.6	6.83	22	3	10	18
September	62	18	48.2	34.2	41.2	2.53	19	4	12	14
October	41	−2	30.2	19.2	24.7	1.79	15	7	10	14
November	23	−33	2.7	−13.3	−5.3	.77	11	10	11	9
December	21	−32	6.8	−6.2	.3	.42	7	11	11	9
TREE POINT LIGHT. Latitude 54° 47′, longitude 130° 52′. F. W. Ross and A. Frey, observers										
January	43	13	35.5	21.6	28.6	2.25	7	6	7	18
February	50	19	44.5	31.7	38.1	9.70	23	4	5	19
March	55	20	47.0	30.0	38.5	6.80	14	11	7	13
April	60	24	52.5	34.6	43.6	6.20	15	7	8	15
May	65	28	56.6	36.3	46.4	3.70	11	8	10	13
June	82	34	62.9	43.2	53.0	8.20	13	8	11	11
July	73	37	64.3	46.4	55.4	5.05	14	11	4	16
August	72	42	67.8	50.2	59.0	.30	3	3	13	15
September	76	31	63.3	44.4	53.8	12.10	11	12	9	9
October	58	26	52.2	37.3	44.8	12.17	19	4	5	22
November	57	21	48.0	33.9	41.0	11.54	20	3	7	20
December	52	31	47.6	38.0	42.8	20.65	29	0	0	31

[1] Record incomplete.

Condensed meteorological reports for 1930—Continued

VALDEZ. Latitude 61° 7′, longitude 146° 16′. J. A. McGilvray, observer

Month	Temperature					Total precipitation	Number of days—			
	Maximum	Minimum	Mean maximum	Mean minimum	Monthly mean		Rain or snow	Clear	Partly cloudy	Cloudy
	° F.	° F.	° F.	° F.	° F.	*Inches*				
January	38	−15	26.2	10.2	18.2	1.32	3	27	0	4
February	35	−14	21.6	7.4	14.5	3.73	8	11	0	17
March	40	−9	30.4	16.5	23.4	[3] 13.55	14	8	4	19
April	50	11	39.9	24.3	32.1	2.93	6	[1] 20	[1] 1	[1] 8
May	52	29	44.0	33.3	38.6	5.05	15	9	4	18
June	66	35	54.5	38.4	46.4	1.41	15	14	5	11
July	75	41	58.7	46.6	52.6	5.77	19	5	1	25
August	76	40	58.1	46.5	52.3	5.91	24	5	3	23
September	60	28	51.1	38.2	44.6	10.41	20	7	5	18
October	49	14	40.2	26.8	33.5	4.15	16	13	5	13
November	40	2	32.9	22.9	27.9	13.17	19	6	3	21
December	43	12	35.1	22.8	29.0	7.61	19	[1] 5	[1] 0	[1] 24

WHALE ISLAND. Latitude 57° 58′, longitude 152° 46′. B. C. Parker, observer

January	46	11	38.7	26.4	32.6	3.47	13	10	6	15
February	39	−2	26.1	12.8	19.4	.86	15	5	8	15
March	47	10	35.9	24.4	30.2	.84	12	8	12	11
April	56	14	42.9	28.9	35.9	1.65	11	11	10	9
May	55	21	45.8	33.5	39.6	7.09	18	10	4	17
June	65	32	53.5	40.8	47.2	5.07	19	13	2	15
July	67	36	59.1	46.6	52.8	4.88	17	10	3	18
August	76	37	62.3	48.6	55.4	2.28	13	17	2	12
September	67	25	53.2	40.8	47.0	3.30	15	14	6	10
October	55	21	44.8	31.1	38.0	3.17	10	16	6	9
November	48	12	38.1	25.3	31.7	6.62	15	13	6	11
December	43	12	37.2	25.4	31.3	4.00	15	11	9	11

WHITE MOUNTAIN. Latitude 64° 40′, longitude 162° 20′. Wm. U. Neeley, observer

January	40	−40	28.0	12.1	20.0	0.52	3	9	3	19
February	34	−29	3.5	−15.8	−6.2	.15	1	14	3	11
March	40	−36	18.9	−9.6	4.6	1.77	6	17	3	11
April	42	−22	30.5	9.1	19.8	--------	--------	14	7	9
May	60	10	43.5	26.5	35.0	--------	--------	12	8	11
June	68	30	58.9	39.7	49.3	3.60	4	12	8	10
July	67	32	57.4	41.2	49.3	3.09	22	2	6	23
August	68	--------	56.8	--------	--------	4.25	20	1	7	23
September	58	7	47.3	19.3	33.3	.84	14	5	9	16
October	48	−13	37.0	8.7	22.8	2.68	16	5	7	19
November	26	−25	14.7	−3.9	5.4	.82	5	12	12	6
December	28	−20	15.5	3.0	9.2	2.15	11	4	4	23

WRANGELL. Latitude 56° 28′, longitude 132° 23′. A. Rasmussen and M. Bunnell, observers

January	40	2	29.2	14.3	21.8	0.84	6	23	2	6
February	48	4	39.1	27.7	33.4	10.61	22	4	2	22
March	52	8	41.3	28.4	34.8	6.89	21	6	6	19
April	62	26	51.0	33.9	42.4	5.42	17	7	10	13
May	76	29	58.7	37.9	48.3	3.72	18	7	9	15
June	82	38	65.2	42.7	54.0	4.60	15	10	9	11
July	79	43	65.7	48.9	57.3	6.45	13	5	6	20
August	82	43	67.2	51.0	59.1	5.08	12	11	7	13
September	74	32	60.7	45.0	52.8	13.15	19	6	5	19
October	58	26	49.1	37.0	43.0	18.52	21	5	5	21
November	54	24	44.8	35.4	40.1	13.68	24	0	5	25
December	54	32	45.8	37.0	41.4	14.43	31	3	6	22

[1] Record incomplete. [3] Approximately correct. Unable to verify at this time.

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